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UNITED STATES
DEPARTMENT OF AGRICULTURE

BUREAU OF
ENTOMOLOGY AND PLANT QUARANTINE
NEWS LETTER

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UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

NEWS LETTER

FOR JUNE 1934

Vol. I (Not for publication) No. 1

ADMINISTRATION

The consolidation incident to the creation of this Bureau has made it imperative to discontinue the Monthly Letter of the Bureau of Entomology (complete in 241 numbers), the News Letter of the Bureau of Plant Quarantine (complete in 43 numbers), and the Blister Rust News (complete in 17 volumes and 6 numbers of Vol. 18), and to inaugurate a new house organ, "The News Letter of the Bureau of Entomology and Plant Quarantine", of which this is the first number. Items will necessarily be more brief and simple than they were in the former periodicals; first, to make a publication of reasonable size and, second, to make one readable to a group covering much larger and more diverse fields of activity.

It is hoped that the new News Letter will create a unity of interest in the Bureau by acquainting all of the personnel with the progress being made in the various lines of work.

Attention is directed to the organization chart of the Bureau on the last page of this number.

FRUIT INSECT INVESTIGATIONS

Observation on Blastophaga psenes L.--Perez Simmons, in charge of the Fresno, Calif., laboratory, reports that in an experiment to find suitable materials for sealing the apical opening of figs to exclude insects that cause infestation and infection of the ripening fruit, several hundred Calimyrna figs were sealed during the progress of caprification. In some instances numerous *Blastophaga* were sealed within the fig cavity. It was observed later that the insects made desperate efforts to force their way through the seals, which may indicate that the instinct to leave the green figs after attempting to oviposit is as compelling as that which prompts the wasps to struggle to enter, even to the point of exhaustion and death. The almost complete absence of remains of *Blastophaga* in ripe caprified figs is further evidence that such is the case.

DATE SCALE ERADICATION

During the month of June ground inspection was continued in previously infested plantings of dates. In inspection from the ground only, few main leaves of the larger palms can be inspected. However, the offshoots or suckers at the bases of the palms can be inspected, and it is on the offshoots that the scales from deep-seated infestations generally appear. When a palm is heavily infested scale is present on the fiber-covered leaf bases. Some scale so situated may have escaped treatment and will not be in evidence until an offshoot grows from the infested area on the trunk. Ground inspection also discloses infestations on young palms that may have had leaf-base infestations when planted. An offshoot taken from a previously infested palm may have near the union with the parent palm scale that has not yet spread to the leaves. The infestation on such an offshoot may persist for some time unobserved, especially if the offshoot makes little growth or is deeply planted. Instances of this kind are not common with Deglet Noor palms, the most numerous variety in the Coachella Valley, but occur more often with other varieties and seedlings.

MEXICAN FRUIT FLY

Fruit flies continue to decrease in citrus groves in Texas.--The decrease in the numbers of Anastrepha taken in groves, noted in the News Letter of the Bureau of Plant Quarantine, June 30, 1934, continued throughout June. Only 1 adult of A. ludens Loew and 29 of A. pallens Coq. were taken in the traps. None of the other species taken frequently during the past months were caught. Owing to the continued rapid fermentation of the malt bait in the traps, the formula for brown sugar attrahent in use at the Mexico City laboratory was substituted. The use of this bait left the traps in a much cleaner condition and therefore easier to operate. One larva of A. ludens was taken in an "off-bloom" grapefruit from a grove in the Mission district. Both adults and larvae of A. ludens had previously been taken in this grove. During the latter part of the month inspections were made of 231 groves in which "off-bloom" fruit had been observed at the time of making the tree-to-tree inspections. With the exception of the grove referred to, these inspections gave negative results. Collection of brush fruits throughout the Valley was continued throughout the month. As predicted, the number of adult A. ludens trapped in Matamoros in June increased considerably over the previous month. A total of 35 adult A. ludens were taken in Matamoros and 1 in Reynosa, the first adult of this species ever taken in the latter town. Following the receipt of reports from the local inspector in Matamoros relative to the large numbers of infested mangoes being received at that market, the officials of the Mexican Department of Agriculture issued instructions to the inspectors in the States of Michoacan and Colima to restrict the shipments of mangoes to the Mexican border towns. As a result, the collections of larvae from imported fruit in Matamoros decreased to about one-half the number taken during May.

JAPANESE BEETLE, MOTHS, AND EUROPEAN CORN BORER

Shipments of plants and vegetables from Japanese beetle territory.--Quantity orders certified from the Philadelphia district in June included 200 large evergreens destined to Canada, 5,000 bench gardenia plants going to Ohio, and 1,500 bench roses consigned to a classified dealer in Connecticut. Replacement orders were also responsible for continued shipping in June. With the exception of one establishment, movements of rose stocks decreased. Green beans are again being shipped in large quantities to Middle Western States from Baltimore, the Eastern Shores of Maryland and Virginia, southern New Jersey, and Morrisville and Bustleton, Pa. Bean-inspection machines were removed from their winter storage at the Frankford Arsenal in Philadelphia and delivered by truck to the inspection centers in Baltimore, South Jersey, and the two points in Pennsylvania. Three bean-inspection trays were shipped to Boston, and one tray and one machine to Syracuse, N.Y. New growth on evergreen and deciduous nursery stock usually marks the end of spring sales of such material. In a number of instances nurserymen for whom stock is inspected have successfully dug and shipped plant material out of season. Although ordinarily the season for shipments of vegetables and dahlia plants ends early in June, such shipments from New Jersey continued into July.

Lead arsenate controls Jap beetle on ballground.--For the past 4 years Shibe Park, the baseball field of the Philadelphia Athletics of the American League, has been treated with lead arsenate. Each year about 350 pounds of the poison has been applied. This year the poison content of the turf is sufficient and additional treatment is unnecessary. The lead arsenate was also effective in destroying night crawlers, which at one time infested the infield badly. Bonemeal was mixed with lead arsenate to stimulate growth of the turf. The grounds are now in excellent condition. During the heavy flight of the insect, the beetles sometimes swarm on the field and interfere with the pitcher and other players. In a recent interview with the ground keeper, it was learned that the club had been withholding shipments of potter's clay to their training grounds in Florida because of the Japanese beetle quarantine. This clay is used at home plate and the pitcher's box. The Florida soil is said to be too fine to allow proper footing for the pitchers. Arrangements were made whereby the clay may be certified when it is desired to ship it to Florida at the beginning of the next training season.

Jap beetle traps placed.--Although the New Jersey trap sales plan originally was contingent upon receipt of orders for 1,000 traps, the program was carried through on the basis of 510 orders received for the large sized traps at a price of $1.50 each. Placement of traps began in Virginia on June 18. Trap distribution in Maryland started on June 21. Trapping activities in St. Louis, Mo., got under way June 19. At the end of June the accomplishments included traps set in 38 Virginia localities, 2 cities in West Virginia, and 44 Maryland communities, in addition to the 800 traps set up in St. Louis. Trapping activities by the State of Delaware began in Clayton, Delmar, Middletown, Smyrna, and a number of farms in Kent County in mid-June. These traps were all baited and in operation by June 25.

All certified greenhouses in infested sections throughout the regulated territory were thoroughly examined early in June to determine that all doors and windows were thoroughly beetle-proofed with screening, and that all glass in the ranges was tightly joined and intact.

A maritime inspector began his tour along the Philadelphia waterfront. This inspector covers approximately 12.5 miles daily afoot. All ships are boarded to determine compliance with the quarantine on fruits and vegetables before the vessels proceed to nonregulated ports. Ship chandlers cooperated very well in supplying only certified produce to vessels sailing for ports outside the restricted zone. Watchmen at piers have also been educated to the point where they will permit quarantined articles to pass onto the piers only when accompanied by a certificate. Materials for the Philadelphia inspection platform were removed from storage at the Frankford Arsenal on June 18 and the platform erected at Third and Florists Streets on June 18 and 19. Noticeable emergence of beetles started in and around Philadelphia about June 11. The adults did not appear in numbers in the suburban sections of the city until the week of June 25. Spraying activities to combat the insect began shortly thereafter on numerous private estates. The adults were particularly active on June 29, when the thermometer reached a new high for that date of 102° F. Considerable trouble was experienced in the produce markets in keeping fruits and vegetables from spoiling and wilting under the high temperatures.

On June 15 men were placed in the field to scout uninfested classified nursery and greenhouse establishments in Virginia, District of Columbia, Maryland, and Delaware. Scouting in the Middle Atlantic and New England States will begin after July 1. Scouting of sand pits in New Jersey during the week of June 16 to 22 resulted in positive finds in a number of establishments. As soon as conditions warrant, shipments of sand will be certified only after fumigation. Screening at establishments processing sand and marl was also checked. By the end of June a number of new infestations had been found in nurseries, greenhouses, and farms in Maryland, necessitating additional handling of vegetables in order to make actual inspections of the produce shipped. Prior to the finding of the infestations it had been possible to certify the products on the basis of negative finds in the fields where grown.

Progress of corn borer certification.--Owing to the extremely dry and hot weather in Ohio, growers endeavored to dispose of most of their stock early in June. Dahlia growers stated that not for a long time had they received so many orders for dahlia plants so late in the season. Some of the growers of dahlias were unable to fill all orders received, as they needed the remaining stock for planting. Several of the growers were obliged to dig stock already planted to enable them to fill the late orders.

Inspection of large quantities of beets with tops and green beans is required at the Boston market to conform to corn borer quarantines issued by Canada and the State of Maine.

GYPSY MOTH AND BROWN-TAIL MOTH QUARANTINE ENFORCEMENT

The gypsy moth in New England.--For several weeks prior to June 15, six temporary inspectors scouted for gypsy moth egg clusters in towns in the part of Maine designated as lightly infested and adjacent to the generally infested territory. Work was performed in 83 towns, an average of 12 hours being devoted to each town. Gypsy moth egg clusters were found in considerable numbers in many of the towns scouted. In central Maine about 10 percent of the egg clusters found above the snow line were hatched, with a 60 percent hatch of those found below the snow line. In western Maine a similar hatch was observed above the snow line, with a 50 percent hatch of egg clusters below the snow line. Surveys to determine the degrees of infestation within the infested zone were made by district inspectors in the course of their travels throughout their territories. Woodlots in the vicinity of Westerly and Charlestown, R.I., were found to be heavily infested with gypsy moth larvae. One of the inspectors in eastern Massachusetts reports heavy defoliation of woodlands in the vicinity of Milford and Hopkinton. An unusually heavy infestation of gypsy moths has occurred in the vicinity of Greenfield, Mass., this year. In one nearby town an area of approximately 500 acres of woodland shows defoliation up to 100 percent. The caterpillars in this particular colony were feeding on sweet fern and had also migrated to a nearby field where they were eating standing grass. Several towns in the Greenfield area disclosed similar conditions.

Movement of building materials.--Granite shipments in the Quincy, Mass., district continued strong for the month of June. The heavy shipments were of building and monumental granite. Quantities of building granite were shipped to Williamsport, Pa. The anticipated seasonal decrease in truck shipments after Memorial Day rush did not materialize. In the Portland, Maine, district, arrangements were made to have about 2,000,000 board feet of lumber, which was sawed before the egg-laying season, yarded in a bare, open field. After drying, the lumber is to be shipped to nonregulated territory. Its storage at a point considerably removed from any source of infestation will facilitate its certification at the time of shipment.

PREVENTING SPREAD OF MOTHS

Spraying against gypsy moth.--By the end of June the feeding of gypsy moth caterpillars was practically over for the year. As spraying operations must be conducted during the interval between the full growth of foliage and the end of the caterpillar feeding season, they were confined almost entirely to the month of June. This year a total of 11,537 acres of woodland in New England and Pennsylvania were sprayed. In addition over 8,000 scattered trees and over 2,700 properties in residential sections have received thorough spraying. Of these totals 3,500 acres of woodland, 5,000 scattered trees, and the entire number of properties in residential sections were in Pennsylvania. During the spraying season, which terminated on June 28, some 300,000 feet of 1-inch high-pressure spray hose was used. As a general rule, from 3,000 to 3,500 feet constitutes the average length of hose line from any one sprayer; but in several instances much longer lines were laid out, 7,000 feet of hose being used from one sprayer.

The gypsy moth in New York City.--Recently two gypsy moth infestations were found in the Bronx. Work is being carried on by the Conservation Department of the State of New York, and a few additional infestations have been discovered. Scouting is being continued in the surrounding territory, and more extensive scouting and treatment in all of the infested area will be necessary later.

FOREST INSECTS

Another potential vector of the Dutch elm disease.--The introduced European elm bark beetle (Scolytus multistriatus Marsh.) has been considered as the most important probable insect vector of the Dutch elm disease in this country. It is very abundant and widespread in the infected area surrounding New York City. However, during the last few months a second potential vector, belonging to the same genus, has been taken at several points in the area. This has been identified by M. W. Blackman, Washington, D. C., as Scolytus sulcatus Lec. Specimens of this formerly very scarce species have been found in Chatham and Maplewood, N.J., Staten Island, N.Y., and Stamford, Conn.

Spraying for control of spruce budworm.--J. C. Evenden, of the Coeur d'Alene, Idaho, laboratory, reports that the Douglas fir stands around the dude ranches, summer homes, camp sites, resorts, etc., of the Cody Canyon, Shoshone National Forest, were again sprayed during June to prevent defoliation by Harmologa fumiferana Clem. This is the fifth year of this project and, although the feeding habits of the insect make it a difficult pest to control, the results have been sufficiently successful to preserve the valuable trees at stake. Annual treatments, which reduce the severity of the defoliation by some 50 to 65 percent, have been instrumental in keeping the trees sufficiently thrifty to resist the attacks of the Douglas fir beetle, an epidemic of which developed in the large areas of Douglas fir weakened by budworm defoliation. On some of the treated trees rather serious outbreaks of a spider mite (Oligonychus americanus Ewing) appeared for the first time this season. In the treatment of these areas an oil emulsion was added to the lead arsenate spray for the control of these mites.

Bark beetle control work effective.--T. T. Terrell, of the Coeur d'Alene, Idaho, laboratory, spent the month of June assisting officials of Yellowstone National Park in directing control measures against an outbreak of the mountain pine beetle (Dendroctonus monticolae Hopk.) in the white-bark pine stands of the Mount Washburn unit. Mr. Terrell reports that the small amount of control work conducted in this unit in the spring of 1933 successfully reduced the subsequent infestation, which is being treated at this time.

Selective control benefits pine-beetle parasites.--W. D. Bedard, of the Coeur d'Alene, Idaho, laboratory, states that although present methods of control successfully reduce the intensity of the mountain pine-beetle infestation, the potential power of increase is unchanged, as both the beneficial and destructive insects are destroyed in relatively equal numbers. Therefore, during the 1933 spring-control project on the Coeur d'Alene National Forest a departure from previous methods was adopted and all infested trees containing 30 percent or more parasites were left untreated in the Steamboat Creek drainage. A recent examination of trees infested in 1933 in this experimental area shows that the parasites have almost doubled in abundance during the past year. At the time this experiment was instituted in 1933 the average parasitization for the entire Steamboat Creek infestation was 30.0 percent, while at the present time it averages 55.3 percent.

Pine beetle develops much earlier than last year.--W. J. Buckhorn, of the Portland, Oreg., laboratory, reports that a comparison of the brood development of the western pine beetle (Dendroctonus brevicornis Lec.) in the spring of 1934 with that of 1933 shows the striking difference that can occur between two seasons as a result of varying climatic conditions. The spring of 1933 was unusually cold and wet; that of 1934, exceptionally warm and early. The difference in brood development, as shown by caging records on the Ochoco National Forest in central Oregon, was as follows:

Emergence	1933	1934	Difference
			Days
First	May 27	April 10	47
Peak	July 9	May 26	48
95 percent complete	Aug. 5	June 25	41
Average	....	....	45

Thus the season 1934 is on the average about 45 days earlier than 1933, as shown by beetle emergence records. Phenological records show a similar advancement of about 7 weeks in plant growth.

Notes on Rogas unicolor Nees.--P. B. Dowden, of the Melrose Highlands, Mass., laboratory, reports that in the summer of 1933 one lot of small larvae of the satin moth (Stilpnotia salicis L.) were attacked by mated females of Rogas unicolor and another lot were attacked by unmated females. There was a heavy winter mortality of the hibernating larvae and only 20 adult parasites, all females, were obtained this summer from the first lot of parasitized larvae and 8 from the second lot. A few males occur in the field in Europe, but it is not known whether they are the progeny of mated or unmated females. This year 3,522 female and 34 male adults have issued from cocoons collected by W. F. Sellers at Budapest, Hungary. Rogas unicolor was first received and liberated by the Melrose Highlands laboratory in 1932. It has been liberated in New England and in the State of Washington.

Further introductions of parasites.--In June adults of several species of parasites that issued from material received from Mr. Sellers were sent out from the Melrose Highlands laboratory for liberation in the field. Adults of Copidosoma geniculatum (Dalm.) Mayr., Tetrastichus turionum Hart., and Actia nudibasis Stein were liberated in infestations of the European pine shoot moth (Rhyacionia buoliana Schiff.) in New England and New York. Angitia laricinella Strand, and Bassus pumilus Ratz. were put out in other New England and New York areas where the larch case bearer (Coleophora laricella Hbn.) is present, and adults of Meteorus versicolor Wesm. and Rogas unicolor were sent to the State of Washington for liberation in satin moth infestations. The two last-mentioned species were also liberated in New England.

Parasite of the imported willow leaf beetle.--R. T. Webber, of the Melrose Highlands laboratory, has been making some observations on the biology of Schizonotus sieboldi Ratz., a European parasite, probably introduced with its host, the European willow leaf beetle (Plagiodera versicolora Laich.). He finds that the parasite develops rapidly. The egg is laid on the pupa of the beetle, rarely on the prepupa, and hatches in a day or two. The young larva seeks the venter of the abdomen, where it develops as an external parasite. Only about 4 days are spent in the larval, about 1 day in the prepupal, and from 6 to 8 days in the pupal stage.

Blue stain hastens death of beetle-attacked pines.--R. A. St. George, of the Asheville, N.C., laboratory, reports that evidence obtained this spring substantiates the view that the blue stain fungus (Ceratostomella pini), an associate of the southern pine beetle, assumes an important role in bringing about conditions favorable for the sudden death of beetle-attacked pines. It was noted in many instances that trees infected by blue stain contained egg tunnels of the beetle, but all adults and eggs had been killed by subzero temperatures of the past winter. When found this spring the foliage of such trees was fading, indicating that, although the beetles mechanically injured the trees while extending their egg tunnels and played an important part in inoculating the trees with spores of fungus they carried with them, it was not until the blue stain penetrated the wood that the trees began to fade rapidly. The importance of the fungus is still further emphasized when it is realized that trees attacked by both beetle and fungus exhibit a change in foliage in from 20 to 30 days, whereas healthy trees girdled mechanically do not fade for a period of 6 months or longer. These findings are in accordance with those of R. M. Nelson and J. A. Beal, who in 1929 succeeded in killing healthy pines that had been caged from insect attack by making inoculations with the C. pini fungus.

FOREIGN PARASITE INTRODUCTION

Elm leaf beetle parasites.--A shipment of 7,500 field-collected eggs of the Japanese elm leaf beetle (Galerucella maculicollis Motsch.) was recently received from R. W. Burrell of the Yokohama, Japan, laboratory. The introduction of the egg parasite of this beetle is in cooperation with the California Agricultural Experiment Station. H. S. Smith's recent report on this material records the emergence of 3,600 Tetrastichus sp. that are apparently different from the species attacking the leaf beetle in Europe. Laboratory experiments have shown that this parasite will reproduce readily upon Galerucella luteola Mull. Colonies have been liberated in three localities in California. This parasite is evidently considerably more effective in Japan than is Tetrastichus xanthomelaenae Rond. in Europe; and in view of the consistent failure of the latter to become established in the United States, it is hoped that better results will be obtained with the Japanese species. Recent shipments from H. L. Parker, of the Hyeres, France, laboratory, comprise: 520 Lebia scapularis Dej., a carabeid predator of the elm leaf beetle, and 1,500 Erynnia nitida R.D., a tachinid parasite of the same insect.

Spruce sawfly parasites.--In cooperation with the Canadian Department of Agriculture, surveys are being made in Japan and Korea of the natural enemies of sawflies closely related to the spruce sawfly (Neodiprion abietis Harr.). Several species of Cleptes are very abundant in Korea and are being studied with a view to importation.

PLANT DISEASE ERADICATION

Barberry eradication in North Central States.--Three hundred and seventy-one locally employed laborers and 71 crew foremen are at work on barberry eradication in the 13 North Central States that comprise the eradication area. Efforts are being concentrated in territory where the barberry population is greatest, that is, in Wisconsin, Iowa, Michigan, Ohio, and Illinois. Removal of bushes in these States will not only give local rust control but will afford protection in the entire spring wheat area against early infection of grain from wind-blown spores. Rust spreads from barberry bushes have been held in check by the dry weather.

Not much rust in Southern States.--Rust on grain in the southern Mississippi Valley in sections where harvest has taken place or will soon be under way has apparently caused little damage, either in reduced yield or shriveled grain. In much of the southern grain area dry weather held the fungus in check. Certain of the southern rusted areas are of unusual interest this year, however, as possible sources of wind-blown inoculum to the grain fields of the North, where in certain sections the crop will mature later than would normally be the case.

Airplane used to trap rust spores.--On May 28 and 30 spore traps exposed from airplanes over the territory north of Dallas, Tex., caught an abundance of rust spores at all elevations up to 4,000 feet, indicating that inoculum was being released from fields into the prevailing southerly winds. This particular spore stage can cause direct infection of grain without the aid of the barberry. Should the recent rains in the spring wheat area bring on a fair crop of late grain, there is the possibility of rust damage resulting directly from wind-blown spores from the South. Normally, provided early infection of grain in the spring wheat area is prevented by removal of barberry bushes, the crop matures in time to avoid serious damage from spore showers originating from rusted grain in the southern Mississippi Valley.

Blister rust control.--Owing to unusual climatic conditions, the field work in the western white pine region was begun almost a month earlier than is customary. Work is now in progress in 31 States and in national forests, national parks, and Indian reservations. The preeradication surveys of control areas made during the fall and winter months were of great value in organizing and starting the various projects for eradication of Ribes. At the present time approximately 16,800 men are engaged in blister rust control work in the United States. Of these, 12,900 are working in the western white pine and sugar pine forests, and the remaining 3,900 in the northern white pine belt of the Eastern States. This work is conducted with PWA and State funds, supplemented by personnel assigned to it from ECW and ERA activities. Thus far about 21,000,000 Ribes bushes have been destroyed on 259,000 acres of land, utilizing 111,000 man-days of labor. In the performance of this work the Civilian Conservation Corps contributed about 10,400 men from 127 camps and these men destroyed 7,476,854 Ribes plants on 98,105 acres of land. It is estimated that, because of the earlier start and the availability of ECW personnel and Public Works funds, about twice as much work will be done this year as last.

Citrus canker eradication.--In June, 11 sweet orange trees on the outskirts of the town of New Iberia, La., were found infected with citrus canker and were destroyed. Five properties were involved in the recent outbreak. In addition to the 11 infected trees destroyed, it was necessary as a precaution to destroy 23 other trees, making a total of 34 trees destroyed in this locality because of canker. The 34 trees were located on 16 different properties within a radius of two blocks of what is believed to be the source of infection. It was in the parish of New Iberia that citrus canker was found 6 or 7 years ago. In Texas one infection reported was in an orchard near Friendswood, Brazoria County; another in an orchard north of League City, Galveston County. The first involved one orange and one lemon tree, which, with a number of adjoining trees, were destroyed and the surrounding property was sprayed with bichloride solution. The second infection was on one grapefruit tree located among some satsumas, and this infected tree was also destroyed. Two recurrent infections of citrus canker, consisting of 3 infected trees, were found in Texas during June and were destroyed.

CEREAL AND FORAGE INSECTS

Corn earworm and tobacco budworm on flax in South Carolina.--The appearance in May of larvae of Heliothis obsoleta Fab. and H. virescens Fab. in association on flax grown near Estill, S.C., where considerable injury has resulted from larval attack, has raised a question as to how important these species are likely to be as enemies of flax, should this crop be grown extensively in the South. Although the extent of damage depends largely on the stage of growth in which the flax is attacked by these insects, a survey was made to determine the number of larvae that could destroy or cause serious injury to the crop.

Parasite of clover seed chalcid is hardy.--An observation of considerable importance was made by L. L. Stitt, Tempe, Ariz., on the parasite Liodontomerus perplexus Gahan. An overwintering larva of this species, dissected from an alfalfa seed on January 28, 1933, and retained in a wax cell, emerged on May 16, 1934, as a normal adult. This is a record of 16 months that this larva remained in the larval stage without undergoing any change. The record not only gives us an insight into the vitality of this insect but also clearly demonstrates the adaptability of the cage type in the handling of this parasite.

COTTON INSECTS

Boll weevil survival.--The emergence of boll weevils from the hibernation cages at Tallulah, La., was 7.51 percent, as compared to 0.15 percent in 1933 and 18.39 percent in 1932, the last being the highest ever recorded. The survival this year was second highest on record. It was also unusually high in Texas and Oklahoma, the Atlantic seaboard being the only section reporting low survival. As a result of the high survival and a late crop, there has been considerable damage to the early squares, particularly in the Mississippi Delta where planters became alarmed in June and requested advice on control from the Department. Considerable dusting has been necessary and at least three companies were operating airplanes. The hot dry weather during the last 2 weeks of June checked weevil development in parts of the Cotton Belt and conditions were much better on July 1 than they were at the beginning of June.

Boll weevil hibernation and survival studies in Oklahoma.--H. C. Young reports weevil activity as observed in the series of standard size (4 feet by 4 feet by 4 feet) hibernation cages at Eufaula, Okla., was approximately 20 times as great between April 1 and May 7, 1934, as during the same period in 1933.

Winter survival of boll weevils taken from gin trash.--At Eufaula, Okla., on November 14, 1933, H. C. Young collected 4,000 boll weevils from gin trash and installed them in 8 hibernation cages. These weevils had been thrown out by a Hartt cleaner from cotton picked on November 9 to 13 and ginned on November 14. At the same time 6 cages were installed with boll weevils collected in the field on November 9 and 10. The emergence from the gin-trash weevils prior to July 1, 1934, was 1.05 percent, and from the field-collected weevils was 0.70 percent. This is quite surprising, as it was thought that the weevils passing through the gin alive would be so battered and broken that few of them would survive.

Chemotropic studies.--Studies conducted at Tallulah, La., for a number of years, using various substances in connection with tanglefoot screens in an attempt to attract the boll weevils emerging from hibernation, were discontinued June 1. A great deal of chemical research was done on isolating the constituents of the cotton plant which attract the weevils. These and other chemicals that seemed most promising under laboratory conditions were tested in the field but have not proved sufficiently attractive to weevils to recommend their use for control.

Cotton leaf worm outbreak.--The local outbreak of leaf worms reported by R. L. McGarr on May 24 in the vicinity of Port Lavaca, Tex., has not spread very much. Adults of the third generation were due to appear during the first 10 days of July, and it will probably be necessary to dust for control of the next generation. The species was also reported by L. F. Curl on June 27, at Chapman Field, Miami, Fla.

Notes on miscellaneous cotton insects.--T. P. Cassidy, Tucson, Ariz., says, "On June 28 a report was received that serious damage was being caused to cotton at Sacaton, Ariz., by a cotton stainer, Dysdercus sp. This report was investigated on June 29 and many Dysdercus were found concentrated on about 1 acre of cotton adjoining an alfalfa field. The infestation appeared to be an influx from the outside, but the source could not be located. According to records made by C. J. King, all of the bottom bolls were punctured by these insects, therefore an attempt was made to control the infestation by the use of sulphur and derris. Three-fourths of an acre was treated with a 4 percent rotenone-derris powder on June 30. This treatment will be repeated July 5 and 9."

Corn root aphid on cotton.--C. F. Rainwater reports that the root aphid has caused considerable damage in several counties in eastern South Carolina by killing small cotton seedlings and stunting the growth of larger plants.

The cotton flea hopper.--The heavy infestation of flea hopper reported by K. P. Ewing in Calhoun and Victoria Counties, Tex., during May, decreased in intensity during June.

The pink bollworm in Texas.--The infestation in the Big Bend area of Texas, as reported by A. J. Chapman, Presidio, Tex., is light and spotted, which is normal for this season of the year. Bolls are not yet large enough to be infested and examinations have been limited to squares and blooms. Examinations by C. S. Rude in the Laguna district of Mexico show the infestation to be unusually high for this time of the year. On some plantations large areas of volunteer cotton are being cultivated. This cotton fruits much earlier than planted cotton and provides breeding places for the early moths. In fields of volunteer cotton the plants averaged 2.4 bolls per plant, about 50 percent of which were infested.

Toxicity of derris, cube, barbasco, and pyrethrum powders to first-instar pink bollworms.--A. J. Chapman, Presidio, reports on a series of laboratory tests designed to show the relative effect of several contact insecticides on first-instar larvae of the pink bollworm. Thirteen powdered insecticides representing different brands of derris, pyrethrum, barbasco, and cube--the products of eight manufacturers--were used. Each of the 13 products was tested in a 1 - 1 mixture with flour. The three pyrethrums did not kill the larvae as readily as did the other materials, but appeared to be very irritating and may show better results under field conditions. Nine of the other ten materials produced mortality of 91.9 percent or higher in from 1½ to 2½ hours. Definite conclusions cannot be drawn from these tests as to the relative merits of the various materials containing rotenone. All of them are apparently toxic against the first-instar pink bollworm. Materials labeled from 1 to 7 percent rotenone were equally effective in the 1 - 1 mixture with flour.

PINK BOLLWORM

The trap-plot cotton in the Big Bend area of Texas made excellent progress throughout June. By the end of the month specimens of P. gossypiella had been found in all but three of the plots in the Presidio section. The first specimens were taken in the two Castolon plots on May 25, in the stub plot on May 28, and in the Presidio plots on June 2. In the Presidio plots there was a gradual increase in the infestation until June 21, after which it began to decrease slightly. In the two Castolon plots the peak of infestation was reached during the week of June 9, and it decreased sharply toward the end of the month. The peak of infestation in the stub plot was reached on June 7, and throughout the remainder of the month there was a considerable decrease both in the number of blooms produced and the number of worms found. Two plots on one farm in the Presidio section have shown a very high infestation, over half the total number of worms found being from these two plots. The owner expressed the opinion that this is due to delayed emergence of moths in the vicinity of these plots because of the especially dry soil. The average percentage of infestation for the 25 plots in the Presidio section for the month of June was 3.44, for the stub plot 7.46, and for the two Castolon plots 0.79.

The field cotton in the Big Bend is now producing quite a few blooms. That in the Castolon section is only about half as large as the trap cotton, but in the Presidio section, because of adverse weather conditions in the early spring, we were not able to get the trap cotton to grow as fast as we had hoped; consequently, there is not so much difference in the size of the plot and field cotton. During the month specimens were found in 10 fields adjacent to the plot cotton in the Presidio section, the average infestation being approximately 0.3 percent. No specimens have yet been found in the field adjacent to the stub plot or in the fields in the Castolon section. No sign of the pink bollworm was found in the two trap plots in the noncotton zone in southern Georgia, or in the volunteer cotton that had come up over the zone.

The inspection of blooms from the cotton at Chapman Field has been continued. Several months ago some of the cotton was moved into a screened house so that only one plat was left outside. On June 19 a pink bollworm larva was found in a bloom from the outside plat, and by the end of the month 7 additional larvae had been found. It will be recalled that on August 23, 1933, 2 larvae were found in hibiscus blooms. An intensive examination of such blooms was immediately made and incidental examinations have been continued up to the present time without finding any more specimens. The last finding from cotton blooms had been in March 1933, when the infestation was attributed to overwintering larvae in the soil. The latest findings, however, indicate that infestation is now coming from some outside source, and efforts are being made to locate it.

TRUCK CROP AND GARDEN INSECTS

Standard insecticides show specific toxicity to certain insects.--C. F. Stahl, Sanford, Fla., reports as follows: "To date our results indicate that under Florida conditions derris is probably not a good insecticide for the control of the celery leaf tier or the southern armyworm but is very effective against the imported cabbage worm. Pyrethrum is an excellent insecticide for the celery leaf tier but is probably less efficient than derris for the cabbage worm, and of no particular value for the large armyworms. Cryolite has proved of no value as a spray for the celery leaf tier and its value as a dust is doubtful. For the cabbage worm it is apparently much less effective than derris, but it appears to be quite effective for the southern armyworm."

Toxicity of nonarsenicals to cabbage worms on spring cabbage in South.--W. J. Reid, of the Charleston, S.C., laboratory, reports: "Satisfactory control of the three most common species of cabbage worms of the Charleston area, the cabbage looper, the diamond-back moth, and the imported cabbage worm, was obtained throughout a period of heavy infestation from the use of only two applications of dust mixtures of derris root powder and clay containing from 1.5 percent to as low as 0.5 percent rotenone. The arsenicals used in this experiment--calcium arsenate, magnesium arsenate, and paris green--did not prove to be as toxic as derris and pyrethrum powders."

Factors affecting insecticidal residues on cabbage.--W. J. Reid, Charleston, S.C., reports that insecticides producing harmful residues should not be applied on cabbage within 40 days of harvest. Strong evidence was obtained that the factor determining residual hazard is not weather, as has been supposed, but plant development. It therefore seems safe to advise that arsenicals can be used on cabbage until after the head begins to form. The results of these experiments indicate that the arsenical used makes but little difference in the amount of residue deposited. Magnesium arsenate, calcium arsenate, and paris green were all used in the experiments, yet, under similar conditions almost exactly the same residue was deposited, regardless of the material used.

Beet leafhopper damage very slight in Sacramento Valley.--W. C. Cook, of the Modesto, Calif., laboratory, reports that most of the sugar beet fields in the Sacramento Valley are free from curly-top, and that only a few fields will be noticeably damaged by this disease in 1934. This valley is the only sugar beet area west of the Rocky Mountains that is not suffering moderate-to-severe curly-top damage this summer. Spraying the wild host plants in the breeding area north of Pacheco Pass killed approximately 90 percent of the overwintering female Eutettix tenellus Bak. that entered that area. It is estimated that but for these spraying operations, at least four times as many leafhoppers would have bred in the spring of 1934, and that, on an average, curly-top would have damaged the sugar beet fields of the Sacramento Valley at least 10 percent.

Clean-up of nightshade effective in controlling pepper weevil.--R. E. Campbell and G. E. Washburn, of the Alhambra, Calif., laboratory, report that although the pepper weevil had made its appearance in a Bell pepper field at San Juan Capistrano, no weevil infestation has been observed in the Huntington Beach section, where the nightshade was cleaned up last winter.

Plowing under of trap crops aids in pea weevil control.--T. A. Brindley, of the Moscow, Idaho, laboratory, reports that promising results were obtained in plowing under pea field borders utilized as trap crops, as a measure of control for the pea weevil. These borders were planted approximately 4 weeks earlier than the main crop, and the blooms attracted and concentrated the pea weevil adults on the border. At the end of June, from collections made in these cages after 5 weeks, it was shown that only 1.7 percent of the original weevil population had made its way to the surface of the soil.

Burning of borders not effective against pea weevils, tests indicate.--Mr. Brindley also reports that the first experimental tests with a specially devised burner directed against adults of the pea weevil in early planted borders were not effective.

Pea weevil survives long periods of submergence in water at low temperatures.--F. G. Hinman, of the Corvallis, Oreg., laboratory, reports as follows: "The mortality of the submerged weevils varied directly with the temperature. * * * The fact that the pea weevil can survive under water for a considerable period of time at low temperatures helps to explain why it has been found successfully hibernating in debris on the ground near Moscow, Idaho. Under such conditions the insect would be in water from melting snow for days and sometimes for weeks at a time."

Red clover is no aid in wireworm control.--As a result of extensive field-plot studies, F. H. Shirck, of the Parma, Idaho, sublaboratory, reports that red clover appears to merit disqualification as a field crop crop where wireworms are to be dealt with.

Naphthalene kills millipedes, tests indicate.--R. S. Lehman, of the Walla Walla, Wash., laboratory, reports that in one field investigated millipedes were damaging winter onions. The onions were attacked when quite small and a considerable portion of the onions were destroyed. The millipede population was estimated at 1,120 per cubic foot. A total of 500 square feet of the field was spaded by hand and crude napthalene was applied at the rate of 800 pounds per acre. The results showed that the napthalene was quite effective in killing the millipedes at depths of 5 or 6 inches.

Heavy rainfall in Fairfax, S.C., area fails to reduce sand wireworm populations.--J. N. Tenhet, Fairfax, S.C., has shown that, regardless of the popular belief to the contrary, the sand wireworm (Horistonotus uhlerii Horn), is able to survive excessive moisture during periods of high temperature.

Wireworm injury to potatoes.--As a result of observations during the Irish potato harvest, K. L. Cockerham, of the Biloxi, Miss., laboratory, reached the following conclusions regarding the gulf wireworm (Heteroderes laurentii Guer.): That wireworm injury is more severe on old, regularly cultivated lands that have been cropped to Irish potatoes or corn; less severe on turf land that has lain idle for 4 or 5 years; least severe in newly cleared ground; and less severe in the heavier, clay soils than in sandy soils.

Cigarette beetle and tobacco moth reduced by low winter temperatures.--W. D. Reed, A. W. Morrill, Jr., and E. M. Livingstone, Richmond, Va., while collecting insects in 10 suction light traps placed in a warehouse of 1,105,000 cubic feet, discovered that the low winter temperatures in the area had materially reduced the number of overwintering larvae of the cigarette beetle, but that less reduction was effected among hibernating tobacco moths (*Ephestia elutella* Hbn.).

INSECTS AFFECTING MAN AND ANIMALS

Screw worm situation in Georgia and Florida.--R. A. Roberts reports that the screw worm-infested counties of both Georgia and Florida are taking steps to organize campaigns for the destruction of carcasses. Burning of the carcasses, rather than burial, is recommended. In Georgia the limits of last season's outbreak have been extended somewhat to the north and east. In Florida, from Baker to Lafayette Counties, from 100 to 300 screw worm cases per county have occurred. The southern limit of the outbreak has not been determined, but it is known to extend south of Gainesville and cases were reported from as far south as Dade County.

Coachella, Calif., laboratory closed.--Owing to curtailment in the appropriation, the eye gnat laboratory at Coachella, Calif., was closed early in June. R. W. Burgess, who was in charge of the laboratory, has been transferred to Uvalde, Tex., where he will continue his work on eye gnats under the direction, as formerly, of D. C. Parman. The residents of Coachella Valley were sufficiently impressed by the results of the experimental trapping of eye gnats to arrange for the continuation of the trapping operations, especially near the schools. G. O. Robertson, who has been associated with Mr. Burgess as agent of the Bureau for the past 4 years, is to be employed by the local Abatement Association to look after this work.

Cochliomyia americana found in nasal passages of sheep.--An interesting discovery relative to infestation of animals by larvae of C. americana Cushing and Patton was recently made by O. G. Babcock, of the Sonora, Tex., laboratory. While examining the nasal cavities of a sheep for larvae of the sheep botfly (Oestrus ovis L.), two third-stage dipterous larvae were found which were identified by Mr. Cushing as C. americana. One specimen was subsequently reared to the adult stage and produced a female C. americana. There were no infested lesions on the animals from which the larvae could have migrated. Infestations of the nasopharyngeal passages of man by larvae presumably of this species are of common occurrence in the tropics, but it is believed this is the first record of a similar infestation in an animal. Mr. Cushing reports that his suspicions that C. americana is a primary myiasis-producing fly which may not breed in carcasses have been partly confirmed by his inability to induce the species to complete its development on meat. It was found to be present in most cases of myiasis occurring in animals this spring and summer at Sonora.

Screw worm campaign in Jackson County, Tex.--Acting upon information and advice furnished by E. W. Laake, 22 ranch owners and tenants have formed an organization for trapping screw worms and other blowflies over an area of about 45 sections located in the vicinity of Olivia, in Calhoun County, and La Ward, in Jackson County, Tex.

Gastrophilus inermis Brauer recorded from North America.--On May 21, while collecting larvae of Gastrophilus spp. from stomachs and rectums of horses slaughtered at Rockford, Ill., E. F. Knipling noticed in the rectum of one horse two larvae that appeared different from G. haemorrhoidalis L., G. intestinalis DeG., or G. nasalis L. The two specimens were kept separate from other larvae collected. They were well advanced in the last instar and pupated on May 22 and 24. Males emerged from each on June 12 and 13. The larvae were determined as G. inermis, and determinations were later checked with the adult specimens. This is apparently the first record of this species being taken in this country.

Mosquito control in Pacific Northwest.--Two rather large operations for control of mosquitoes breeding in snow water have been carried on in mountainous areas of Oregon and Washington during the spring and early summer by H. H. Stage, of the Portland, Oreg., laboratory, in cooperation with the ECW and the Forest Service. These areas are located in the Mt. Hood and Columbia National Forest, respectively, where CCC camps are also located. The work consists largely of applying oil to accumulations of water from melting snow where there is little or no drainage. CCC labor was used for this work. The number of mosquitoes in the area has been markedly reduced. Under Mr. Stage's direction approximately 2,500 of the mosquito-destroying top minnow (*Gambusia patruelis* Baird and Girard) have recently been transported from northern California to Oregon and Washington and planted in locations favorable for breeding. Young fish have already been observed in these breeding places.

FOREIGN PLANT QUARANTINES

Recent entomological interceptions of interest.--On October 9, 1933, a living larva of the papaya fruit fly (*Toxotrypana curvicauda* Gerst.) was taken at Baltimore, Md., in a papaya (*Carica papaya*) in ship's quarters from Panama. This represents the first definite record in our files of this fruit fly being intercepted from Panama. Adults of two flea beetles (*Phyllotreta atra* (Fab.) and *P. nemorum* (L.)) were intercepted at San Francisco in packing around rose plants in the mail from Czechoslovakia. A thrips, *Adraneothrips alternatus* Hood, was intercepted at Philadelphia on banana debris in cargo from Guatemala. A cushion scale, *Icerya seychellarum* (Westw.), was intercepted at New Orleans on a leaf of croton (*Codiaeum* sp.) in ship's quarters from the Philippines. Another scale, *Pseudococcus boninsis* Kuw., was intercepted at Hidalgo, Tex., in a sugarcane stalk in baggage from Mexico. Adults of the leaf beetle *Saulaspis graphica* Germ. and the darkling beetle *Salax lacordairei* Guer. were intercepted at New York in excelsior packing around grapes in cargo from Argentina. The scale insect *Aspidiotus degeneratus* Leon. was intercepted at San Francisco on *Camellia japonica* in cargo from Japan. A living adult of the leaf beetle *Cheirispa distincta* Baly was taken at Mobile, Ala., on banana debris in cargo from Panama. A living adult of the square-necked grain beetle (*Silvanus gemellatus* Duv.) was intercepted at New Orleans on a pineapple in cargo from Cuba. Living larvae, pupae, and adults of the West Indian sweetpotato weevil (*Euscepes batatae* Waterh.) were intercepted at New York in sweetpotatoes in baggage from St. Lucia, British West Indies.

Recent pathological interceptions of interest.--Our first interception of a *Cercospora* sp. leaf spot on ivy was made at Seattle on ivy mailed from Denmark. Diseased Bell peppers from the Dominican Republic were intercepted at Houston and found to be infected with *Colletotrichum nigrum*, *Phoma destructiva*, and *Cercospora* sp., our first interception of any of these diseases from that country. Several interceptions of *Septoria citri* have been made in recent months on citrus fruits from Mediterranean countries but the first one from Australia was made at Baltimore, the host being lemon. Our first interception of *Phoma destructiva* from Panama was made at Baltimore, on a tomato. A New York inspector found mosaic on peony from Germany, our first interception of mosaic on this host. Oranges from Palestine intercepted at Philadelphia were infected with *Oospora citri-auranti*, our first interception of this rot from Palestine. A Philadelphia inspector made our first interception of *Colletotrichum nigrum* from Java, the host being red pepper.

Mangoes carry fruit fly larvae.--V. J. Shiner reports this occurrence from Laredo, Tex.: "Mr. Vinzant states that on May 19, 1934, while inspecting traffic on the footbridge, he observed an old lady and a 4-year-old boy coming from Mexico with several sacks of groceries and vegetables. Upon examination he found a half-consumed mango in a sack of tomatoes. Two larvae were found on the tomatoes and two in the partially eaten mango." One of the larvae turned out to be the orange maggot (*Anastrepha ludens* Loew).

What "infested" may mean.--The following analysis of the larval population in an intercepted shipment gives a realistic picture of the actual number of insects present: A lot of 60 loquats taken from a passenger's baggage at Providence, R.I., was found to contain 189 larvae of the Mediterranean fruit fly (*Ceratitis capitata* Wied.).

Passenger brings infested olives.--On January 18, 1933, eight pupae of the olive fruit fly (*Dacus oleae* Rossi) were intercepted at Baltimore in a quart of partially dried olives in baggage from Italy. In at least 75 percent of the olives infestation was evidenced by exit holes and empty pupal cases.

Always the unexpected.--An egg mass of the satin moth (*Stilpnotia salicis* L.) was taken from a Seattle Times wrapper at 3rd Avenue and Pike Streets, Seattle, on June 8, by M. J. Forsell, an inspector at the port of Seattle.

Inspectors find new pests in sweetpotatoes.--Weevils found at New York in sweetpotatoes from Mexico on April 4, 1934, are reported by a representative of the Bureau of Entomology and Plant Quarantine to be Cossoninae of an unknown genus but near *Ithaura* and *Dioptrophorus*. No record could be found of their habits. A similar finding of larvae and pupae in sweetpotatoes from Brazil on May 23, 1934, is ascribed to the Curculionidae with the genus undetermined and with a remark to the effect that it is a quite unfamiliar parasite on sweetpotatoes.

Plants found concealed in printed matter.--Since January 1, 1934, Messrs. Schram and Schroeder, two foreign segregators at Chicago, have made eight interceptions of plant material concealed in packages of newspapers and printed matter. Not only is this important from the standpoint of the actual number of interceptions so made, but it increases their vigilance over parcels passing through the distribution center for distant States where no inspectors are stationed.

DOMESTIC PLANT QUARANTINES

Transit inspection.--Sixty-seven Japanese beetles were taken by transit inspectors at Chicago from refrigerator cars at the Pennsylvania Railway team-track yards on July 11 and 12. Fifty-six of the beetles were alive. The cars contained green beans and lima beans shipped from points in New Jersey, and had been partly unloaded when the beetles were discovered. The hampers available at commission merchant houses were very carefully inspected. After the cars were emptied all were cleaned, and all save one were fumigated. It is understood that loading of refrigerator cars with products consigned to nonregulated areas is now under safeguard during the time of day when the beetles are flying. A daily average of 84,325 sacks of parcel post mail arrives at the Chicago railway mail terminal, in the new Post Office Building, according to the annual report of the transit inspector in charge.

Black-stem rust of grains.--The inspection of premises of applicants desiring to ship immune species of barberry to the 13 "protected" States was begun early in July.

White-pine blister rust.--The State Entomologist of Kentucky reports the issuance of a new regulation designating Menifee, Morgan, Powell, and Wolfe Counties in that State as white-pine growing districts, and authorizing agents of the Commissioner of Agriculture to remove wild currant and gooseberry plants in those counties when such bushes are found "growing within 1,500 feet of valuable pine forests." The order also covers the destruction of cultivated bushes "located at abandoned or unoccupied houses." Regulations concerning the white-pine blister rust were also recently placed by the States of Virginia and West Virginia. The Virginia quarantine prohibits the growing of currants and gooseberries in an area of 54 counties, and provides authority for the destruction of Ribes on any premises, except that the destruction of cultivated species is limited to those growing within 1,500 feet of white-pine stands. In West Virginia, the Forest Service nursery at Parsons is brought under protection by the establishment of surrounding quarantine zones in which the growing or possession of Ribes nigrum and other species of currant and gooseberry plants is prohibited. In the New England States nurserymen who hold pine-shipping permits are submitting to this office, through the gypsy moth inspection organization, a report of each shipment of five-leafed pines made from the nursery. Lists of such shipments have recently been sent to officials of the destination States.

CONTROL INVESTIGATIONS

Dyar's rule doubted.--F. L. Campbell, Takoma Park, Md., at the invitation of J. C. Gaines, College Station, Tex., contributed a section on Dyar's rule to his manuscript on the number of instars of Heliothis obsoleta Fab. It is shown graphically that Dyar's rule is of doubtful value for corroboration of the observed number of instars, because it may indicate a missing instar when it is quite certain from other evidence that no instar was overlooked.

Poison for mosquito larvae.--D. E. Fink, Takoma Park, finds that none of nine substitution products of phenothiazine is as toxic to mosquito larvae as is phenothiazine itself. Methyl phenothiazine, the simplest substitution product, most nearly approached phenothiazine in toxicity.

BEE CULTURE

Studies codling moth poisons as affecting bees.--During the latter part of June, Geo. E. Marvin, Somerset, Md., began a new phase of his work on the PWA project of the Division of Fruit and Shade Tree Insects, dealing with codling moth control. This is a study of the effect on honeybees and other pollinating insects of the various organic insecticides applied to fruit trees. Front Royal, Va., was chosen as the headquarters for the field work because large numbers of bees are kept in that vicinity, as it is not only the center of an apple-growing district but also has an abundance of blue thistle and sweetclover to afford nectar for the bees when the fruit trees are not in bloom.

Clarification of beeswax.--Mr. Marvin reports that in a study made on the clarification of beeswax, of the five materials used in the process (Bentonite, Volclay, Western Clay, Klearite, and Animal Charcoal), Western Clay was found to be the best for the purpose of absorbing and holding the dark-colored material found in crude beeswax taken from brood combs. When the mixture was filtered a clear, light-colored wax was produced.

A Bacillus reared.--C. E. Burnside, Somerset, reports that while using a culture medium containing sterile brood filtrate to which sterile honey was added, an organism which morphologically and culturally compares closely with Bacillus lanceolatus Maasen was isolated on three occasions from samples of parafoulbrood. B. lanceolatus was first isolated and studied in Europe. There is only one previous record of its having been isolated in America, that by A. P. Sturtevant, Laramie, Wyo.

California buckeye kills bees.--E. L. Sechrist, who has been in charge of the Pacific States Bee Culture Field Laboratory, Davis, Calif., reported that, at the request of a group of beekeepers in the San Joaquin Valley, G. H. Vansell, who has done considerable work on plants poisonous to honeybees, made a trip into the area from which great mortality of adult bees had been reported this summer. He traced the cause of death to the California buckeye, which seemed to be unusually deadly to bees this season, which was a very dry one, just the kind of year when bees suffer most from buckeye poisoning. The most severely affected apiaries were at about the midpoint of the buckeye range and bees could feed on buckeye by first going down to the early blooming trees below them and then following the blossoming trees on up to the mountain heights. In this area some apiaries had been rendered entirely worthless. In one county several thousand colonies were poisoned this year by buckeye.

Bees in transit.--Under a cooperative agreement with the Railway Express Agency, Warren Whitcomb, Jr., in charge of the Southern States Bee Culture Field Laboratory, has been able to study en route the conditions to which package bees are subjected in transit. He reports that the first experimental shipment was made on June 11 to 19 from Natchez, Miss., to Lansing, Mich., and thence to Alba, Mich., where the packages were introduced into colonies. One package in the crate died. Several leads obtained in this shipment will be further tested in subsequent shipments.

Hold suspected bees 96 hours.--A. P. Sturtevant, in charge of the Intermountain Bee Culture Field Laboratory, Laramie, Wyo., reports: "A previously given recommendation, that packages of bees from localities where there is suspicion of American foulbrood should be held for at least 96 hours before being placed in combs, was tested with four colonies during the past winter. The colonies were made with packages from diseased colonies and held 96 hours before being placed last fall in drawn combs containing honey. No disease has yet appeared in these colonies."

IDENTIFICATION AND CLASSIFICATION OF INSECTS

Coleopterous larvae received from Denmark.--A. G. Boving has recently received two lots of identified coleopterous larvae from Denmark, one, including 14 vials, coming from S. P. Kryger, the other, comprising 11 vials, from E. Rosenberg. Doctor Boving has translated from the Danish the comprehensive collection notes accompanying the specimens and has added the material to the collections in the National Museum.

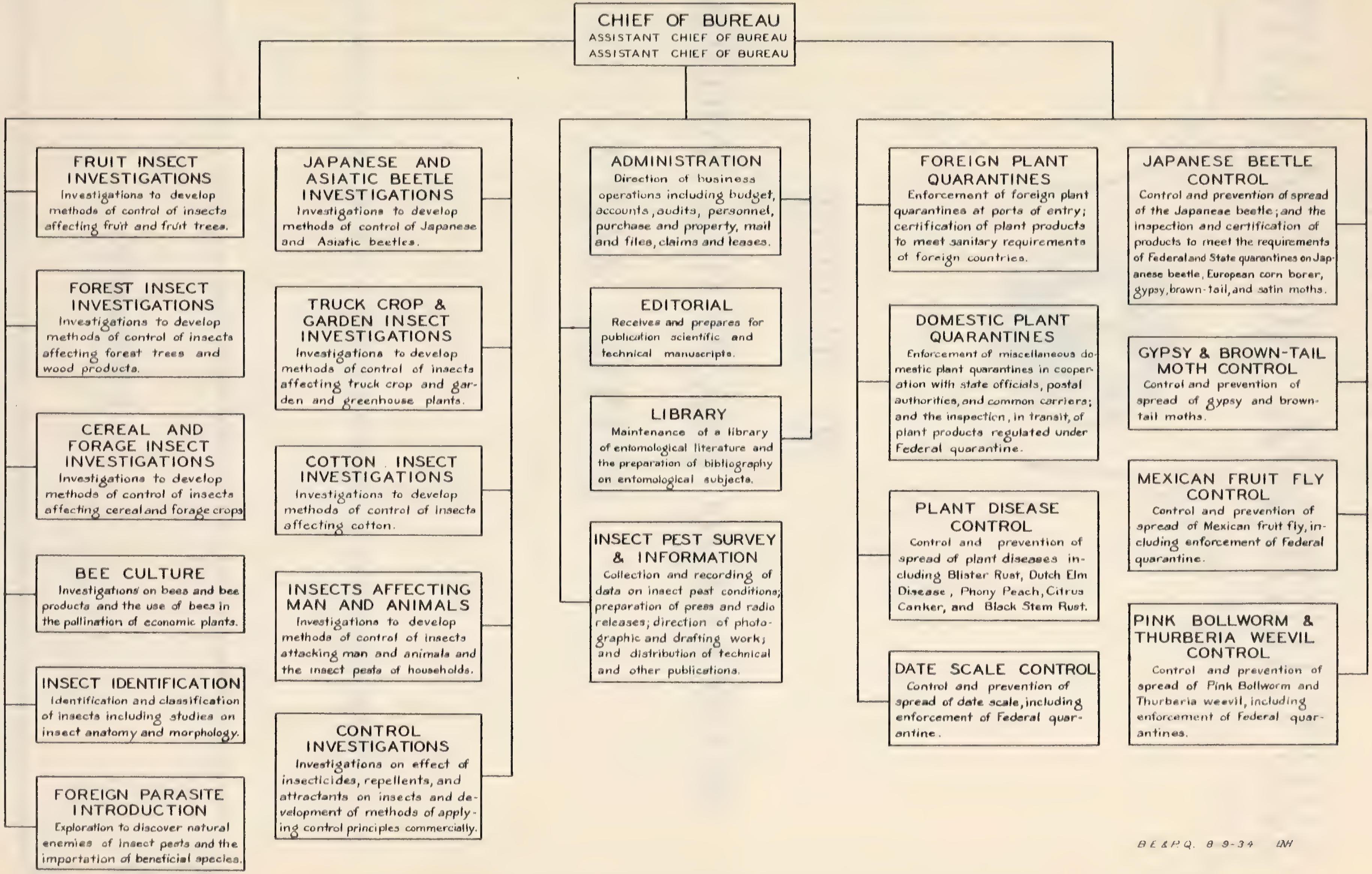
A new maple leaftier.--August Busck has recently identified two specimens of a moth collected at Mattituck, L.I., N.Y., in June 1932, as the European tortricid Argyrotoxa forskaleana L., a maple leaftier not previously known to occur in this country. The insect will, in Mr. Busck's opinion, probably prove to be a minor pest of maple, occasionally abundant in some localities. The specimens were collected by Roy Latham and were brought to Mr. Busck by W. T. M. Forbes.

New northern record for this mosquito.--Aedes mitchellae (Dyar) has been identified by Alan Stone from a mixed lot of specimens submitted in connection with the Civilian Conservation Corps mosquito survey. They were collected at Chicopee Falls, Mass., on June 15, 1934. This is an extreme northern record for a species which until recently was known only from Georgia to Texas. It has recently been collected in light traps in several Maryland localities as far north as College Park.

Rare primitive phalangid received.--N. W. Davis, a graduate student at Cornell University, has recently sent to H. E. Ewing, as a gift to the National Museum collections, two specimens of the primitive phalangid Siro americanus Davis. These specimens represent one of the two known species of the suborder Cyphophthalmi occurring in the New World, and are the only specimens of this suborder in the National Museum. These arachnids are ticklike in appearance and are of about the size of our common wood tick (Dermacentor variabilis Say). The specimens were taken in Florida.

DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE



CHIEF OF BUREAU
ASSISTANT CHIEF OF BUREAU
ASSISTANT CHIEF OF BUREAU

FRUIT INSECT INVESTIGATIONS
Investigations to develop methods of control of insects affecting fruit and fruit trees.

FOREST INSECT INVESTIGATIONS
Investigations to develop methods of control of insects affecting forest trees and wood products.

CEREAL AND FORAGE INSECT INVESTIGATIONS
Investigations to develop methods of control of insects affecting cereal and forage crops

BEE CULTURE
Investigations on bees and bee products and the use of bees in the pollination of economic plants.

INSECT IDENTIFICATION
Identification and classification of insects including studies on insect anatomy and morphology.

FOREIGN PARASITE INTRODUCTION
Exploration to discover natural enemies of insect pests and the importation of beneficial species.

JAPANESE AND ASIATIC BEETLE INVESTIGATIONS
Investigations to develop methods of control of Japanese and Asiatic beetles.

TRUCK CROP & GARDEN INSECT INVESTIGATIONS
Investigations to develop methods of control of insects affecting truck crop and garden and greenhouse plants.

COTTON INSECT INVESTIGATIONS
Investigations to develop methods of control of insects affecting cotton.

INSECTS AFFECTING MAN AND ANIMALS
Investigations to develop methods of control of insects attacking man and animals and the insect pests of households.

CONTROL INVESTIGATIONS
Investigations on effect of insecticides, repellents, and attractants on insects and development of methods of applying control principles commercially.

ADMINISTRATION
Direction of business operations including budget, accounts, audits, personnel, purchase and property, mail and files, claims and leases.

EDITORIAL
Receives and prepares for publication scientific and technical manuscripts.

LIBRARY
Maintenance of a library of entomological literature and the preparation of bibliography on entomological subjects.

INSECT PEST SURVEY & INFORMATION
Collection and recording of data on insect pest conditions; preparation of press and radio releases; direction of photographic and drafting work; and distribution of technical and other publications.

FOREIGN PLANT QUARANTINES
Enforcement of foreign plant quarantines at ports of entry; certification of plant products to meet sanitary requirements of foreign countries.

DOMESTIC PLANT QUARANTINES
Enforcement of miscellaneous domestic plant quarantines in cooperation with state officials, postal authorities, and common carriers; and the inspection, in transit, of plant products regulated under Federal quarantine.

PLANT DISEASE CONTROL
Control and prevention of spread of plant diseases including Blister Rust, Dutch Elm Disease, Phony Peach, Citrus Canker, and Black Stem Rust.

DATE SCALE CONTROL
Control and prevention of spread of date scale, including enforcement of Federal quarantine.

JAPANESE BEETLE CONTROL
Control and prevention of spread of the Japanese beetle; and the inspection and certification of products to meet the requirements of Federal and State quarantines on Japanese beetle, European corn borer, gypsy, brown-tail, and satin moths.

GYPSY & BROWN-TAIL MOTH CONTROL
Control and prevention of spread of gypsy and brown-tail moths.

MEXICAN FRUIT FLY CONTROL
Control and prevention of spread of Mexican fruit fly, including enforcement of Federal quarantine.

PINK BOLLWORM & THURBERIA WEEVIL CONTROL
Control and prevention of spread of Pink Bollworm and Thurberia weevil, including enforcement of Federal quarantines.

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UNITED STATES
DEPARTMENT OF AGRICULTURE

BUREAU OF
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NEWS LETTER

VOLUME I

UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

NEWS LETTER

FOR JULY 1934

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FRUIT INSECTS

Control of pecan nut case bearer under humid and under semiarid conditions.--Under the semiarid conditions existing at Brownwood, Tex., C. B. Nickels has obtained from 75 to 95 percent control of severe infestations of the pecan nut case bearer by the use of two applications of acid lead arsenate, using 3 pounds in 50 gallons of water. Basic lead arsenate was less effective, and magnesium arsenate gave no control. In the more humid Georgia pecan-growing section lead arsenate has in previous years been found not only comparatively ineffective against this case bearer, but injurious to the pecan foliage. Among other materials, nicotine mixtures have been tested by G. F. Moznette, in charge of the Albany, Ga., laboratory. Infestations have been reduced from 97 to 99 percent this season from two applications, made 1 week apart, of nicotine sulphate (40 percent nicotine) at a strength of one part in 1,000 of spray mixture with 0.75 percent summer oil emulsion in one plat and with 0.25 percent fish oil in another. A single application of the oil-nicotine mixture gave a control of 93 percent.

Conference on citrus pest control.--On July 17 a conference was held at Pomona, Calif., for the purpose of working out a schedule of recommendations for citrus pest control in that district for 1934. Participating in this conference were H. J. Quayle and Ralph Smith, of the Citrus Experiment Station, Riverside, Calif., R. S. Woglum, of the California Fruit Growers Exchange, H. J. Ryan, Agricultural Commissioner for Los Angeles County, M. B. Rounds, Farm Adviser for Los Angeles County, F. D. Young, Meteorologist, of the U.S. Weather Bureau, Pomona, Calif., and E. A. McGregor, of the Whittier, Calif., laboratory. Much good came out of this meeting, and a program of control was drawn up that met with the general approval of all participants.

Dispersion of dried fruit beetle.--In June and July D. F. Barnes, of the Fresno, Calif., laboratory, liberated 19,850 stained beetles in the vicinity of traps that were baited with fermenting dried peaches. The stains used were water solutions of eosin, methyl violet, and malachite green. A total of 65 beetles were identified after spraying the catches with solutions of alcohol or sodium hydroxide. The distances from liberation points to recovery points ranged from 200 to 864 feet. The longest interval between liberation and collection was 24 days.

A new use for worn-out motor tubes.--W. P. Yetter, Jr., Cornelia, Ga., reports that worn-out inner tubes, no longer of use on an automobile, can be used to good advantage in the laboratory. In many laboratories the usual 8-inch battery jar is used, with small rubber bands to hold the cheesecloth cover in place over the jar. These small rubber bands break easily, and often the live insects within the jar escape. Cross sections, one-half inch wide, cut from 4.75 by 19 tubes make ideal bands to hold the covers over the battery jars. These bands will outlast the small rubber bands and afford much better protection for the specimens.

MEXICAN FRUIT FLY

No Mexican fruit fly taken on Texas side of Rio Grande.--Neither adults nor larvae of the Mexican fruit fly were taken on the Texas side of the Rio Grande in July. This was the first month to elapse without taking adult Anastrepha ludens Loew since December 1933. This negative showing was made during the operation of the largest number of traps in use at any one time since the inauguration of this project. At the end of the month, 7,050 glass traps were being operated on 541 premises. However, although no A. ludens were taken, the first specimens of the dark fruit fly (A. serpentina Wied.) and the West Indian fruit fly (A. acidusa Walk. (fraterculus auct.)) to be taken in over 3 months were captured in traps, 5 of the former and 1 of the latter being taken during the month. In addition, 23 A. pallens Coq. were trapped.

Fewer fruit flies in Matamoros.--In July only 18 adult fruit flies were trapped in Matamoros, as compared to 36 in June; however, there was a decided increase in the number of larvae recovered from imported fruits. A total of 11,340 larvae of A. ludens, 42 of A. acidusa and 27 of A. serpentina were taken from imported mangoes, oranges, and pears in Matamoros. The large importation of infested fruits should result in an increased catch of adult flies in the traps in Matamoros during August.

PREVENTING SPREAD OF MOTHS

More defoliation by gypsy moth.--Defoliation by the gypsy moth this summer has been more extensive in many sections than has been reported for several years and, in some other sections, greater than ever before. The indications are that the total acreage of woodland showing from slight to complete defoliation will be much greater than during any year since 1929.

Gypsy moth inspection in Pennsylvania.--In addition to performing routine duties, employees in Pennsylvania assisted with the enforcement of the State gypsy moth quarantine. They inspected a total of 43 shipments of forest products, consisting chiefly of 4,494 mine props and lagging and 11 cords of wood. As a result of this inspection, two new gypsy moth egg clusters were found and treated on a mine prop in Bear Creek Township. On August 1 the State of Pennsylvania employed 25 men and assigned them to cutting sprout growth in cut-over areas in Jenkins Township.

Emergency work on gypsy moth.--A recent summation of gypsy moth control, accomplished by Emergency Conservation Work during the fiscal year just ended, shows that work was done by men from 1 camp in Vermont, 10 camps in Massachusetts, and 7 camps in Connecticut. Up to July 1 a total of over 76,000 man-days of labor were used, based on a 6-hour day; 460,000 acres of woodland and open country were scouted; and 170,743 egg clusters were creosoted. For the months of June, July, and August the number of C.C.C. and V.C.C. men allotted to gypsy moth work was reduced to about 120. The principal work of these men has been putting up and patrolling burlap bands at gypsy moth infestations. Early in August they had burlapped 46,782 trees; had crushed at these burlap bands 479,811 gypsy moth caterpillars and 42,365 pupae; and had creosoted 2,300 female moths. They have also creosoted 4,396 new egg clusters since the first of July.

No severe defoliation by satin moth.--No severe defoliation by the satin moth has been reported this year. Although this insect is widely distributed, the fact that it confines its feeding to willows and poplars makes it improbable that there will be extensive areas of defoliation. Reports indicate many of the towns in the infested area in New Hampshire have light infestations but, except at a few points, the infestations have not been sufficiently dense to cause noticeable defoliation. In Massachusetts light infestations were reported from a number of towns, with some defoliation in one of the towns on the coast just north of Boston.

Keeping tabs on tools.--It has always been a problem to keep the special tools, innumerable small parts, and such items as oil measures, funnels, supply cans, axes, saws, shovels, crowbars, spray nozzles, oil coats, oil hats, and other articles with which spraying machines are equipped when they leave for the field, properly sorted and stored, so that an inventory of these items could be made, independently of the general stock of supplies, quickly and accurately at any time. As a solution to this problem, a locker-room, with specially designed compartments or lockers, in which is stored the equipment of each spraying machine, has been in use for several years.

CEREAL AND FORAGE INSECTS

Chinch bugs in Illinois.--C. Benton, Lafayette, Ind., reports that migration of bugs from hibernation began about May 1 and was about over by May 6. The field counts showed that the migrating bugs selected winter wheat, rye, barley, spring wheat, and oats, in the order named. Infestations in wheat, rye, and barley were very heavy, but the numbers of bugs in oats remained very low until wheat, rye, and barley began to die as a result of drought combined with the feeding of chinch bugs the middle of May. At that time considerable migration of old adults to oats and corn began, as the wheat, rye, and barley died or was plowed up. Oats and corn adjacent to such fields received infestations of old bugs late in May and early in June. In some instances these crops suffered considerable injury from the old bugs, although the more severe and extensive damage was to wheat, rye, and barley. In oats the bugs showed a tendency to concentrate in the greener, more succulent areas. Mortality of the old bugs increased rapidly early in June, however, and by the middle of June they ceased to be an important factor. Under the conditions prevailing this year at least, the control of chinch bugs by trapping them in barley plantings is apparently out of the question. They were fully as abundant in wheat and rye as in barley, and when these grains became unsuitable to them they flew into oats and corn. In another year conditions may be entirely different.

Breeding corn to find double cross hybrids resistant to corn borer.--L. H. Patch, of the Toledo, Ohio, laboratory, spent 2 weeks during the corn-pollination season at Bloomington, Ill., working at the experimental plots of J. R. Holbert, of the Bureau of Plant Industry. The purpose of the future breeding program in this project is to find another single cross of corn with the specific tassel characteristic (that prevents the entrance of young European corn borers into the tassel buds) and another later single cross which, when crossed with single cross Hy x R4, will give two double crosses with the tassel characteristic for use in the northern and southern sections of the Corn Belt, respectively. With this in mind, 21 new single crosses have been made for observation next year under corn borer conditions at Toledo. The 7 inbreds (exclusive of R4 and Hy), 4 of which are comparatively new, were found to possess the desirable tassel characteristic, but none to such an extent as inbred R4.

New type sled-harvester useful in corn borer control.--C. H. Batchelder and D. D. Questel, Arlington, Mass., report that experimental work in collaboration with the Bureau of Agricultural Engineering, with a new type of sled-harvester, indicates that a very practical implement will be added to the mechanical devices now available to growers in areas where summer clean-up measures are desirable. The new sled-harvester is designed for use in fields of early varieties which are heavily infested and which may be cut for ensilage prior to moth emergence. The machine is also adapted for harvesting small corn that cannot be cut effectively with a larger implement.

Aphids as vectors of mosaic disease.--J. W. Ingram, Houma, La., states that decreases in numbers of Aphis maidis Fitch and A. bituberculata Wilson indicate that heaviest mosaic transmission probably occurs in February and March, when these vectors are most numerous. Results of examinations for these aphids indicate the possibility of producing seed cane with little mosaic in certain lightly infested areas and by spring planting.

Glassy cutworms in Oregon.--L. P. Rockwood, Forest Grove, Oreg., reports: "Bait traps for moths were first put out on July 19 in old locations near Cornelius and Forest Grove. Up to July 31, we had already taken 127 individuals of the glassy cutworm. The highest number taken in any previous season, including August, was 92 in 1930."

Southwestern armyworm at Forest Grove, Oreg.--Mr. Rockwood also says, "Moths of Prodenia praefica Grote were taken at a light at Forest Grove in July. This is the first time we have taken this species so far northwest of the Cascade Mountains. Heretofore, our most northerly record on the west side of the Cascades was from Benton County in 1932."

The wheat midge in Washington.--Max M. Reeher, Forest Grove, reports that the biennial survey of the wheat midge in western Washington was made the latter part of July. One wheat midge larva was found in a field of spring wheat at Falls City, the most southern point of infestation recorded in the 1930 survey. None was found there in 1932, owing to the absence of wheat fields in that section in that year. No wheat midge was found in the scattering wheat fields south of Falls City to Chehalis, Wash., where wheat is more generally grown.

Wheat joint worm infestation in Oregon lowest in 9 years.--T. R. Chamberlin, Forest Grove, reports that stubble counts in the Molalla, Oreg., district have shown the lowest infestation since the insect was discovered there in 1926. Infestation in 10 fields ranged from nothing to 6.5 percent, averaging 3 percent. Infestation in the sample field was 1.5 percent. A comparison between the infestations in the sample and nearby fields for the last several years is as follows:

Year	Field infested				
	Sample	Nearby	Nearby	Nearby	More remote
	Percent	Percent	Percent	Percent	Percent
1930------	91.2	72.0	69.4	38.3	--
1931------	69.9	67.5	79.7	13.3	--
1932------	47.5	51.6	30.9	--	--
1933------	19.3	8.4	3.0	--	70.5
1934------	1.5	6.5	0	--	6.5

The conditions that brought about the greatly reduced infestation in 1934 began in the winter of 1932-33 when most of the winter wheat was killed out, together with clover in the wheat stubble of the previous season. Stubble in which the clover was killed was plowed under early in the spring and, to compensate for the loss of the winter wheat, much spring wheat was sown and in many fields this was too late to become infested. In the spring of 1934, therefore, most of the stubble unburied at the time of the issuance of the joint worm adults was uninfested, or but slightly infested, and the remaining fields of winter wheat stubble were widely scattered and had infestations below normal. The scattering over a wide area of the few adults issuing from the few fields of lightly infested stubble resulted in an infestation in 1934 still lower than that of 1933. We believe that we have here a practical large-scale demonstration of the control of the wheat joint worm by plowing under the stubble. It seems probable that it will be several years before the joint worm can reach its former abundance, even under very favorable circumstances. A survey of western Washington as far north as Falls City showed no infestation in that territory.

Parasitization of western spotted cucumber beetle.--Chamberlin also reports that dissection of two lots of beetles in July showed 8.7 and 5.4 percent parasitization by Celatoria diabroticae Shimer. Of 36 females dissected, 1 showed ovaries full of small eggs on July 21. This is our earliest record for the appearance of eggs which, with few exceptions, have not appeared until the February following the summer of issuance. Newly issued adults of Diabrotica soror Lec. were found as late as July 27 at Chehalis, Wash. As reported previously, emergence of this species began as early as

June 2 at Carlton, Oreg.

Status of alfalfa weevil.--Geo. I. Reeves, Salt Lake City, Utah, reports: "Since June 25 the numbers of eggs and larvae of the alfalfa weevil have dropped to nothing at Fallon, Nev., Salina, Utah, and Medford, Oreg., and oviposition is being resumed at the last-named place. Eggs are still being deposited in small numbers (0.88 per square foot) in dry stems at Salt Lake. The number of new adults is high (5.9 per square foot) at Salina, with 2.25 cocoons per square foot still present, and the number of the parasite Bathyplectes curculionis Thoms. is nearly 10 per square foot, of which 32 percent promise to be effective. Elsewhere, the number of new adult weevils is relatively low, ranging from 3.38 at Medford to 0.13 at Fallon. The decrease since last month is due partly to migration from the hot fields, but largely also to death from heat. Bathyplectes cocoons have been recovered at Medford, as a result of the colonization made there last spring."

Pea aphid outbreak in Georgia.--Geo. W. Barber, Savannah, Ga., reports that on May 11, 1934, a serious outbreak of Illinoia pisi Kalt. was observed on Australian peas in Sandersville, Ga. When first observed, a field of 15 acres had been nearly destroyed and the aphids were spreading to vetch in adjoining fields, where severe injury was also being done. Field counts were made to determine the aphid population. The greatest number of aphids counted per leaf was 132, and the lowest, 9. The spring season had been unusually wet, which was favorable to the rapid development of the aphids. Such conditions were also favorable to development of the fungus Empusa aphidis Hoffman. At the time of examination 25.7 percent of the aphids had been destroyed by this fungus. The fungus spread rapidly in the field and, assisted by other enemies, stamped out the aphid infestation on vetch after the peas had been plowed under. Within 2 weeks no aphids could be found in the vicinity. On May 11, incredible numbers of adults of Syrphus americanus Wied. occurred in this pea field and larvae of this fly were present at the rate of 34 per 100 leaves, or an estimated total of 322,274,304 in the field. At least as many larvae of the convergent ladybeetle also were present.

Bran-poison-water versus bran-poison-oil in grasshopper bait.--C. C. Cartwright, Sacramento, Calif., reports that associated field tests on the value of lubricating oil in baits for grasshopper control, under California conditions, have been made. Over 90 percent of the hoppers were in the adult stage. The following formulas were used:

No. 1	No. 2
Bran, 100 pounds	Bran, 100 pounds
White arsenic, 5 pounds	White arsenic, 5 pounds
Water, 14 gallons	Western oil, 1-1/2 gallons

Ten cages of hoppers were swept from each plot, and counts of the dead in each cage were made on the 3 days following the sweeping. The bran-poison-water bait was significantly more efficient than the bran-poison-oil bait.

JAPANESE AND ASIATIC BEETLES

Cotton as a food plant of the Jap beetle.--I. M. Hawley and T. N. Dobbins, Moorestown, N. J., report that cotton plants grown in pots in the greenhouse were placed in two large field cages early in July and Japanese beetles were restricted to the cotton as food. In check cages smartweed was supplied as food. In the first test, at the end of 5 days, 30 of 200 beetles were alive in the check cage, and only 2 and 4 in the cages with cotton. In a second test, 19 of 200 beetles were alive at the end of 11 days in the check cage and 7 and 15 in the cotton cages. In both tests beetles fed readily on the cotton. Results to date indicate that in the absence of more preferred food plants cotton will be readily eaten, even early in the feeding period.

Jap beetles killed by feeding on buckeye blossoms.--Messrs. Hawley and Dobbins also report: "A buckeye tree at Mullica Hill, N.J., has also been under observation this year. It is larger than the tree at Lambertville and beetles are more abundant in that locality. Counts of dead beetles under this tree averaged over 100 per square foot. Beetles were caged on blossoms from this tree and kept in W. E. Fleming's testing cellar, where a high temperature and a high humidity are maintained. In the first test, 157 were dead and 45 alive at the end of 36 hours. Beetles were caged on smartweed as a check, and when examined 40 were dead and 162 were alive. In a second test with material from the same source and run for the same length of time, 153 were dead and 51 alive, whereas in the smartweed check, 8 were dead and 190 alive. Buckeye flowers evidently contain some material that is toxic to the beetle. Beetles eat into the sides of the small flowers on the main spike and apparently must feed for some time before they ingest enough of the poison to cause paralysis."

Trapping of Jap beetles.--"Data have been obtained on the 33 original tests set up at Woodstown, N.J.," reports F. W. Metzger, Moorestown, "and several additional experiments have been inaugurated. Millions of beetles have been captured in the traps during the month. * * * It has been shown definitely that certain of the cheaper grades of geraniol are as attractive to the beetle as are the more expensive lots. The cheaper grades have been analyzed at the Moorestown, N.J., laboratory and it is believed that definite specifications for a much cheaper material will be available for next season. Emergence of the beetle at Whitesbog, N.J., was considerably later than in the southern part of the State, as beetles were not captured in numbers until July 17. One field, as in 1933, is more heavily infested than the others, little injury being apparent elsewhere. Up to July 15 more beetles were being captured in the traps than could be found on the foliage. For the past three seasons the experimental traps at Woodstown have apparently protected a large field of asparagus from beetle injury. On July 24, 48 traps were placed 10 feet apart along one side of an asparagus field near Cohansey, N.J., where beetles had seriously injured an adjoining block of plants. The results to date indicate that infestation is much lighter in the part of the field where the traps are located than where there are no traps. In 1933, after having entirely defoliated favored food plants, the beetles fed on evergreens in nurseries at Shiloh, N.J. It was believed that traps might be of value under such conditions, as they would afford an added attraction for the beetle. Accordingly, 100 traps were placed in operation on July 10. As all available men were engaged on other work, the project was made a cooperative one, the nursery collecting the beetles. To date no feeding on the evergreens has been observed."

Jap beetle repellents.--Mr. Metzger also reports: "Definite results have been obtained from tests of repellents at a rose garden at Roadstown, N.J. Of all the substances tested, o-chlorophenol is most outstanding in repellent action. As many thousands of rose plants are in the vicinity of the dispensers, the conditions for the tests were especially severe and further work will be necessary before definite recommendations can be made. The work at another nursery was terminated because of the sudden decision of the nursery to have all the rosebuds cut off, although the general infestation was light.

Soil treatment retards growth of roses.--Mr. Metzger says that "A careful check on the condition of the greenhouse roses that had received soil treatment for the control of Japanese beetle grubs was made on July 25. At this time it appeared that arsenate of lead in all dosages has retarded the growth of Lum's Double White, but no statement can be made as to the seriousness of this retardation. Souvenir also appeared to be retarded, but in a lesser degree. Briarcliff, Talisman, and Senior were apparently not affected by the treatment."

Vegetables stunted by soil treatment.--F. E. Baker, Moorestown, says that "The various vegetables planted in soil treated with 500, 1,000, and 1,500 pounds of acid lead arsenate per acre (for control of Japanese beetle larvae) were harvested and analyzed for arsenic as they matured. To date all plants in the poisoned plots seem to be stunted in growth. Lettuce, peas, radishes, and cabbage have been harvested and show a decrease in yield in all treated plots."

Control of Jap beetle on asparagus.--Mr. Metzger and A. R. Rolfs report that "Several instances of severe beetle injury to asparagus brush and the apparent ineffectiveness of regular asparagus beetle dusts to prevent it, were brought to our attention earlier in the month (July). Sprays consisting of 3 pounds of derris plus 3 pounds of flour to 100 gallons of water, and 20 pounds of lime plus 3 pounds of aluminum sulphate to 100 gallons of water were applied on two heavily infested blocks on July 21, 27, and 31. Both sprays were successful in driving the beetles from the plants, but did not remain effective after heavy rains. The derris sprays killed a considerable number of beetles."

Oils attract oriental and Asiatic garden beetles.--A number of essential oils, used in the Asiatic garden beetle study, were tested at Jericho, N.Y., as attractants for the oriental beetle. It was noted that dipentene had a slight attraction for the adults. During the month of July, in cooperation with the Japanese Beetle Control Division at Moorestown, 44 oils have been used in tests to determine their value as attractants for the Asiatic garden beetle. Some of these oils apparently have some attraction. A complete report will be prepared later in the season, but at this time tansey oil and petit-grain oil seem to have more attraction than any of the other materials tested. In all of the above-mentioned tests, standard Japanese beetle traps have been used and the oils have been prepared by Mr. Metzger.

FOREST INSECTS

Use of arsenic in nursery beds.--L. G. Baumhofer, of the Coeur d'Alene, Idaho, laboratory, reports that pine transplants at the forest nursery near

Halsey, Nebr., are being seriously injured by arsenic 4 years after treatment of the soil. In 1930, crude white arsenic at 80 pounds per acre was applied to a plot, by mixing and spreading with manure before plowing, as a test for control of white grubs. Serious losses from grubs occurred in both treated and untreated beds, but there was no noticeable arsenic injury to the 2-1 ponderosa pine transplants that season. Early in the spring of 1934 this plot, after being idle 3 years, was utilized for 1-1 jack and ponderosa pine transplants. By late in the spring the discoloration of foliage where arsenic had been applied was conspicuous, while adjacent beds remained normal. The 1-1 jack pine is particularly susceptible, and considerable mortality had occurred by midsummer. Recent tests indicate that the light, sandy loam soil in this section of the nursery is about neutral in acidity. Last year a small experiment with lead arsenate in dosages as low as 500 pounds per acre, showed that the age of the transplant stock, as well as the dosage, was an important factor in the extent of arsenic damage, the younger trees suffering most. New transplants in the lead arsenate plots are showing serious injury from arsenic the second season after treatment of the soil.

Mortality of mountain pine beetle in spruce.--W. D. Bedard, Coeur d'Alene, reports that six infested Engelmann spruce trees were examined for adults of the mountain pine beetle. Larvae of both the mountain pine beetle and the Engelmann-spruce beetle were abundant in all of these trees, but in no instance did the mountain pine beetle develop beyond the third larval instar, although the Engelmann-spruce beetle matured and emerged without any undue mortality.

Regional forest insect survey speeded by aid of C.C.C.--F. P. Keen, of the Portland, Oreg., laboratory, reports that the checking of sample plots in the ponderosa pine region of eastern Oregon to determine the trend of present bark beetle outbreaks was materially hastened during the past month by the help of the C.C.C. Two crews of C.C.C. men were placed in the field under the supervision of entomologists and covered 7,040 acres of the check plots in July. It is expected that the program, which normally takes 3 months' time, will be completed in 2 months.

Forest fires follow insect outbreaks.--According to Mr. Keen, it so often happens that large forest areas injured by insects are later swept by disastrous forest fires, that this aftermath of a forest-insect outbreak appears inevitable. Early outbreaks of the hemlock looper in thousands of acres of hemlock and spruce on the Oregon coast were followed by tremendous conflagrations. In 1929 a forest fire, sweeping through a large area of beetle-killed lodgepole on the Chelan National Forest, caught and burned to death two forest officers. This month (July) a 15,000-acre fire on the Colville National Forest, reported as the worst fire of the year, is burning through a stand of Douglas fir killed in 1930 by the Douglas fir tussock moth (Hemerocampa pseudotsuga McD.). The consequences of forest-insect outbreaks are far reaching.

New spray formula for elm leaf beetle.--C. E. Hood, of the Melrose Highlands, Mass., laboratory, reports that good control of the elm leaf beetle has resulted where trees were sprayed early with lead arsenate at the rate of 4 pounds to 100 gallons of water, with fish oil added as an adhesive at the rate of 4 fluid ounces to each pound of poison. Trees at Woburn, Mass., were sprayed with this mixture on May 28, soon after the beetles had begun to deposit eggs, and the foliage has since shown less injury than that on trees sprayed with the same mixture on June 22, as it controlled the adults from the start. The fish oil used is still protecting the foliage from the next-generation beetles that may feed upon it before going into hibernation.

Improvement cuttings in Southeastern States do not endanger stands.--A preliminary survey made recently by R. A. St. George, Washington, D.C., and B. J. Hückenpahler, Asheville, N.C., of some of the areas in the southeastern part of the United States where pine had been cut during the past year by C.C.C. personnel, including the stand-improvement work in national forests, as well as that done in making truck trails, fire breaks, telephone lines, etc., on State and private forest lands, indicates that the cutting of pine, even during the summer, does not seriously endanger the stands from insect attack.

PLANT DISEASE ERADICATION

Progress in blister rust control.--The season's accomplishments in blister rust control to the end of June showed that a total of 66,601,371 Ribes bushes were destroyed on 857,658 acres of land, with 334,287 man-days of labor, to protect forest areas producing valuable white pine growth. Control of blister rust on these areas has been established, as the few remaining Ribes bushes cannot supply enough pine-infecting spores to cause serious damage. Once established, control conditions are maintained by periodic examination of these areas and re-eradication work on any sections that are becoming restocked with Ribes. Excellent progress was made during June, the first full month of the Ribes-eradication season. More than twice as much work was performed as in May, as shown by the eradication of 45,376,677 Ribes plants on 597,841 acres, with 223,287 man-days of labor. Approximately 18,429 men were employed on this work during the month. Some of this personnel, most of whom are laborers, were employed with P.W.A. and cooperative State funds, and the remainder were assigned in connection with E.C.W. and F.E.R.A. blister rust activities.

Blister rust in New Jersey.--Blister rust has been found for the first time on 5 native pines in Sussex County, N.J. A total of 2,100 acres have been scouted, of which 400 contain white pines. These range from scattered pines growing in pastures to pure stands of pine about 30 years old, with a few large pines that have acted as seed trees. Some of the latter are 90 feet high and have long, straight trunks that would produce at least 1,000 board feet of lumber. A Ribes-eradication crew of five men has been procured from the C.C.C. camp located on the Stokes State Forest to apply the necessary control measures to protect the pine.

Status of phony peach eradication.--Two of the Bureau's inspectors on the phony peach disease project, accompanied by two employees of the Texas Department of Agriculture, completed inspection work on July 9, in both commercial and home orchards in the principal peach-growing sections of Bexar and Travis Counties, Tex. Prior to this, similar work had been done in Kerr, Limestone, McLennan, and Robertson Counties. In commercial orchards 69,545 phony trees were found, or 0.52 percent of the trees inspected, and in home orchards 12,609, or 1.07 percent of the trees inspected. There are several important peach nurseries in these areas, in addition to the commercial orchards. In Louisiana, the work was confined to two parishes in the northwest corner, Caddo and Bossier. In this State also, our inspectors were accompanied by State employees. A total of 396 phony trees was found in Louisiana, 200 in commercial orchards and 196 in home orchards. In Georgia, 612,321 trees were inspected up to July 31. Of this number, 7,864 showing phony disease were found in commercial orchards and 1,017 in home orchards, or a total of 8,881 found this season in that State alone. Of these diseased trees, 4,618 were found in Peach County, the center of the infested area.

P.W.A. assisting in barberry eradication.--The Public Works program for prevention of black stem rust is progressing satisfactorily, with a total of approximately 500 men at work in the 13 North Central States that received funds for this purpose. During July nearly 71,000 barberry bushes were destroyed. Barberry-eradication crews in the field this summer consist of from 6 to 10 laborers, supervised by a foreman who has had previous experience in plant-disease control work. The crews have been assigned to counties or localities known to be badly infested with barberry bushes, and to those that have suffered severe losses from stem rust in recent years.

Damage by stem rust slight in spring-wheat region.--With harvest well under way in the North Central States, it is evident that losses from black stem rust to small-grain crops is of little consequence, as compared with the damage to yield and quality resulting from the drought. Although stem-rust inoculum became general throughout the Dakotas and Minnesota in July the spread of the disease was greatly retarded by lack of moisture necessary for the germination of spores, and by the premature ripening of the grain. A preliminary estimate indicates that the damage from stem rust will not exceed 5 percent in any State in the spring-wheat area.

Dutch elm disease spreads rapidly to healthy elms if beetles escape from affected trees.--Comparison of two areas in New Jersey where work was done in 1933 shows that the number of trees attacked increases greatly if diseased trees are not destroyed before the bark beetles escape to other trees. Areas A and B were exactly similar in 1933 as to number of diseased trees found per square mile. On area A all diseased trees but one were removed and burned before the beetles escaped, but on area B only about half of the diseased trees were destroyed in time. This year there are already four times as many newly affected trees per square mile in B as in A and area B has already lost four times as many elms as area A, and it will cost four times as much this year to clean up area B of diseased trees, as it will to clean up area A. Diseased trees are usually attacked by beetles within a few days after general wilting or death of the foliage. The entering beetles lay eggs in the bark and in 50 or 60 days the grubs that hatch have reached full size, transformed into adult beetles, and gnawed their way out through the bark. The matured beetles feed on healthy elm twigs and thus apparently carry the disease to nearby trees. In order to prevent this spread, diseased trees must be removed before the beetles mature and escape. Thorough scouting to locate the diseased trees and prompt action in destroying such trees appear to be the only means of preventing spread.

COTTON INSECTS

Three species of cotton root lice in South Carolina.--C. F. Rainwater reported that three species of plant lice were attacking the roots of cotton in the vicinity of Florence, S.C. These specimens were identified by P. W. mason. The white root louse (Trifidaphis phaseoli (Pass.)) was the most abundant early in the season and was the most destructive of the three species in Florence County. It disappeared early and none were found after July 1. They seem to attack the roots deeper in the ground than the others. Although less abundant this season in Florence County, the corn root aphid (Anuraphis maidi-radicis Forbes) is thought to be usually the most abundant of the three species. The species that Doctor Mason states is "either a strain of a Rhopalosiphum or a new genus", Mr. Rainwater reports "are a sort of purplish color when first becoming adults, and later just before they die turn to an almost brown color." He had reared it through 13 generations by August 18. He says, "It is easily reared but does not produce alate forms as easily as either the white or green species. Alate forms of the white T. phaseoli and the green A. maidi-radicis can be obtained by putting a large number of nymphs in a vial and rearing them to adults, but only occasionally do I get an alate form of the purple or brown louse even though they may be crowded in the vial."

Thiodiphenylamine and sulphur dust not satisfactory for boll weevil control.--R. C. Gaines and M. T. Young, in reporting field-plat control tests against the boll weevil at Tallulah, La., during July, show that where a mixture of 1 pound of thiodiphenylamine and 9 pounds of sulphur was used in three applications, at the rate of 5 pounds per acre per application, there was no apparent reduction in the weevil infestation.

Derris powder fails to control boll weevil.--Mr. Young and G. L. Garrison made field-plat tests at Tallulah against the boll weevil with derris root mixtures containing 0.5 percent, 1 percent, and 2 percent rotenone, and results were compared with those obtained in plats treated with calcium arsenate and with others receiving no treatment. The square-infestation counts and bloom counts indicate that no boll weevil control was effected by seven applications of the dusts containing rotenone, when used in the field at the rate of 5 pounds per acre per application.

Hydrated lime not effective against boll weevil at Tallulah.--In field-plat tests, using mixtures of equal parts of hydrated lime and calcium arsenate and other mixtures consisting of one-third calcium arsenate and two-thirds hydrated lime, Messrs. Young and Garrison found boll weevil control was not equal to that obtained by the use of calcium arsenate alone. They also found that in the plats treated with hydrated lime alone the square-infestation records and bloom-count records indicate no weevil control.

Notes on cotton insects, injurious and harmless.--J. W. Folsom and K. H. Smith, Tallulah, studied the life histories and habits of many cotton insects during July. Graphocephala versuta Say which was suspected of causing "hopper damage", was caged in large numbers on normal cotton plants out of doors. They punctured the plants hundreds of times but caused no deformities of growth in the plants. Stictocephala festina Say fed freely on leaves, buds, and stems but without causing any apparent damage to the plants. Lygaeus bicrucis Say was taken by hundreds on cotton on June 13. A few were still alive on July 31. In the insectary they punctured small cotton plants, made split lesions in the stems, caused the stems to turn red, mated freely and laid eggs which hatched. In large outdoor cages these insects caused no noticeable damage or abnormal growth on large plants. The caterpillar Heliothis virescens Fab., well known as the tobacco bud worm, was found eating into and hollowing out cotton squares at Tallulah. It also eats leaves and stems of cotton. Autographa brassicae Riley, the cabbage looper, rags the cotton leaves in the same manner as does the leaf worm. The beetle Colaspis brunnea Fab. not only ate the edges of the bracts and ate holes in the bracts, but in the insectary also ate holes in many young cotton squares, which fell from the plants within 24 hours. Out of doors on large plants in cages they ate holes in many squares, causing them to fall, and also killed small cotton plants. The adults of the weevil Conotrachelus erinaceus Lec. eats into leaf buds and small cotton squares. Beetles of Pachybrachys sp. ate into squares, causing them to fall. Systena elongata Fab. gnaws leaves and buds and eats into small squares, causing them to drop.

PINK BOLLWORM

Trap-plot work gives good returns.--The work in the Big Bend of Texas has been continued throughout July, with some interesting developments. By July 12 it was evident that some of the trap plots would be of no further use; therefore, 8 of the 25 plots in the Presidio section and the stub plot were discontinued. Additional plots showing very light infestation or those where the surrounding field infestation was approximately the same were discontinued from time to time, and by the end of the month only 6 were being used. One of the discontinued plots was located below Bresidio at a point where infestation was extremely heavy last fall. Through July 26 over 8,000 blooms from this plot and nearly 2,000 from the adjacent field cotton had been inspected without finding any worms. The most heavily infested plot is located in a field about 2 miles above Presidio. To date 4,098 worms had been found in the 25 plots, and of this number 2,034 came from the heavily infested plot. Of the 145 worms found in adjacent fields, 75 of them came from the field in which this plot was located. The inspectors have been trying, without success, to find some reason for the heavy infestation in this plot. The owner of this field is perhaps the largest farmer in Presidio County and has been very much interested in the trap-plot work. He is ready and willing to carry out any recommendations or suggestions we may offer. At Castolon, in Brewster County, the two half-acre plots have also been continued throughout the month, and the inspectors continue to find a rather large number of worms. The number varies, but for the month of July averaged approximately 70 worms per day. Throughout the month approximately 75,000 blooms from the adjacent field cotton were inspected without finding any worms. General inspection of the fields has also been made from time to time. The owners of the field in which the two plots are located are highly pleased with the results of the work. They stated that even if they do not pick any cotton from the half-acre plots they will have received good returns from the land and labor involved in producing the trap cotton. These two plots, together with six in the Presidio section, are being continued.

Recess in wild-cotton eradication.--The wild-cotton eradication program in Florida has been discontinued for this season. All of the area along the west coast from Naples northward has been recleaned for the second time this season. In addition, a number of new colonies, which were quite small, were located and removed. These were missed during the previous recleaning because quite a bit of the land was covered with water, so that the area could not be scouted, and in other places the land had been burned over. It will be recalled that this second recleaning was done to prevent any of the seedling plants producing fruit before the eradication program can be resumed next winter. During the month some 46 acres were covered, from which 330 mature plants, 9,460 seedlings, and 114 sprouts were removed. During the recleaning a considerable number of bolls were examined from time to time without finding any bollworms.

Inspection of blooms and bolls.--The daily collection and examination of blooms from the cotton at Chapman field was continued throughout the month, a total of 961 blooms being examined. From these, 14 pink bollworm larvae were taken. In collecting the blooms it is almost impossible to avoid missing a few, and during the month 34 that had been missed and developed into bolls were examined and 2 specimens of the pink bollworm were found. Laboratory inspection was completed at a number of the field stations during the month, but inspections are still being made at the San Antonio laboratory. Only 3 pink bollworms were found and these all came from material collected in the regulated area of western Texas. Approximately 1,000 green bolls, collected from the new crop in the Salt River Valley, were inspected, with negative results. This area was released last December.

TRUCK CROP AND GARDEN INSECTS

Curly-top damage in western Colorado and eastern Utah.--W. A. Shands, of the Grand Junction, Colo., laboratory, reports that in the western Colorado sugar beet fields, an abnormally large percentage of the beet leafhopper is carrying curly-top virus of a very virulent form. In the Grand Valley, Colo., district, an average of 21.8 percent of the beets were infected with curly-top during the latter part of June, as compared to 16.8 percent during the corresponding period last year.

Curly-top disease of beets continues serious in Utah.--E. W. Davis, Salt Lake City, says that the sugar beets throughout the state of Utah are rather spotted in regard to the extent of curly-top disease. Cache Valley has a very good prospect for a beet crop. Box Elder and Salt Lake Counties will be very seriously affected by curly-top and hopes for a beet harvest have been abandoned. In Utah County most of the beets planted were of the resistant variety. In Sevier Valley practically all of the beets are heavily diseased, except those immediately adjoining the mountains on the west side of the valley. For a month many beet fields in the larger section have been showing 100 percent curly-top infection.

Curly-top in southern Idaho and Montana.--J. C. Chamberlin, H. G. Bergen, and D. E. Fox, Twin Falls, Idaho, report: "Beets throughout central Idaho were in most fields severely stunted and yellowed from heavy infestation of the beet leafhopper and the high percentage of curly-top. By July 10 to 13 infestation was as extensive as in 1931 (the bad year) by the first of August. The present status of beet acreages in the south-central Idaho beetgrowing areas is summarized in the following table.

Area	Acreage			
	Planted	Thinned	Abandoned	Growing
Jerome-Eden-Hazelton	2,180	1,506	674	550
Twin Falls (south side)....	6,714	3,691	3,023	280
Burley	5,362	4,414	1,084	[a] 4,414
Paul-Rupert...............	6,406	3,971	2,595	[a] 3,971
Oakley	960	577	404	[a] 577

[a] Acres thinned. Additional abandonment is anticipated before or at harvest.

Conditions in eastern Idaho in general are favorable for a good crop. Many of the fields around Pocatello, Osgood, and Blackfoot are injured and some quite severely, but these localities should still produce fair yields. The Sugar City - St. Anthony district is suffering to some extent from drought, but the beets are still doing fairly well. Notwithstanding anticipated damage in local and outlying areas, crop prospects for eastern Idaho as a whole are still excellent. In Montana the heaviest curly-top damage is centered around Billings, within a radius of from 15 to 17 miles. The small area injured indicates that this has resulted from a local infestation in the immediate vicinity of Billings. Injury throughout Montana as a whole is very small and, with the exception of a comparatively small acreage, good yields are anticipated.

High temperatures and mechanical methods save pea crop in Washington and Idaho.--J. E. Dudley, Madison, Wis., was detailed to assist in the control of the pea aphid on seed peas in eastern Washington and western Idaho. He observed that the aphids, when knocked from the pea vines at a time of day when the temperatures were highest, were unable to return to the plant, but succumbed in a very short time. The sparseness of the pea growth permitted the sun's rays to reach the surface of the soil. Drags 40 feet long and 4 poles wide were constructed of bamboo poles, and in 2 days 1,200 acres of peas were gone over with them. In some fields the control obtained ranged from 50 to 90 percent. Where the percentages of kill were lower, the vines covered the ground so that the sun's rays could not reach the aphids that were knocked from the plants. Fifteen thousand acres of seed for cannery peas are involved, and the prompt inauguration of control measures will probably reduce the injury considerably.

Pea weevil larvae found in canned peas in New York State.--J. R. Douglass, of the Estancia, N.Mex., laboratory, reports that 37 percent of the 27 cans of peas collected by B. J. Landis, Columbus, Ohio, in western and southwestern New York, contained pea weevil larvae. A total of 200 peas per can were examined. In the infested cans the peas containing weevil larvae ranged from 1.0 to 7.5 percent with an average of 0.8 percent infested peas for all cans examined. An additional number of peas revealed entrance holes of the newly hatched pea weevil larvae that had been killed during the canning process before they had begun to feed. No infestations were found in canned peas collected in Pennsylvania, Indiana, or Tennessee.

Winter destruction of nightshade successful in controlling pepper weevil.--J. C. Elmore, of the Alhambra, Calif., laboratory, reports that recent field surveys have demonstrated that infestations of the pepper weevil in the area where all nightshade that could be found was destroyed during the winter of 1933-34, is in striking contrast to infestation in adjacent areas where the nightshade clean-up was not practiced.

Dusts more effective than sprays in controlling Mexican bean beetle in Virginia.--According to a report submitted by L. W. Brannon, of the Norfolk, Va., laboratory, preliminary results from experiments in field control of the Mexican bean beetle at Onley, Va., show that in general the insecticidal dusts were more effective and gave greater increases in yield of snap beans than did the sprays. The best results were obtained with derris-dust mixtures containing 0.75 percent rotenone, with tobacco dust or talc or ground marc, as diluents. The results indicate that talc is probably the best diluent for derris root powder and also gives excellent foliage protection, as well as yield increases.

Derris powder gives promise as Mexican bean beetle insecticide in Ohio.--Reporting on results of recent insecticidal tests against the Mexican bean beetle, N. F. Howard and H. C. Mason, Columbus, Ohio, state:"(1) Of the sprays tested, derris powder in water gave as good if not better control than any. Synthetic and natural cryolite gave slightly better control than did magnesium arsenate. Magnesium arsenate with flotation sulphur paste, barium fluosilicate, potassium hexafluoaluminate, and derris extract gave good control, equalling that obtained with the cryolites. Copper cyanide and pyrethrum extract did not give satisfactory control. Pyrethrum powder gave little or no control. Magnesium arsenate (2 to 50) injured bean foliage slightly. (2) Of the dusts, derris with various combinations of carriers mixed gave very good control, the best control of any in the series. Derris-tobacco dust and derris-infusorial earth gave practically as good control as derris with the carrier mixed; but derris-talc, derris-marc, and derris-lime did not give satisfactory control. The 10 to 90 dusts mixed from derris of a rotenone content of 3.9 percent gave about as good control as the 15 to 85 and 20 to 80 mixtures. The commercial brands, with one exception, gave about the same control as the home mixed. Barium fluosilicate, both undiluted and with flour, gave good control. Pyrethrum and tobacco dust mixed gave very unsatisfactory control. Synthetic cryolite with all carriers gave very little or no control. The control obtained from the derris dusts was as good or better than that from derris powder used as a spray. (3) Results: The results of these experiments give a fair indication of the effectiveness of these materials against the Mexican bean beetle in Ohio. Although the infestation was not as heavy as sometimes occurs at South Point, Ohio, the foliage of some of the checks sustained injury as high as 70 to 75 percent. Considering the fact that the beans received only one treatment and that this was not applied at the proper time for best control, derris powder used either as a dust or as a spray looks very promising as an insecticide for the control of the Mexican bean beetle."

Derris gives satisfactory control of cabbage worms in Ohio.--N. F. Howard and R. H. Davidson, Columbus, report the following results of insecticidal tests against cabbage worms on cabbage in Ohio: "(1) Derris-dust mixtures containing 0.4 percent rotenone gave satisfactory control when diluted with talc, hydrated lime, ground marc, infusorial earth, or tobacco dust. (2) Derris root powder used as a spray (5 pounds of the powder containing 4 percent rotenone to 100 gallons of water) did not give as satisfactory control as when used as a dust. (3) Pyrethrum powder used as a dust in combination with various diluents, such as cryolite-tobacco dust and cryolite-sulphur-tobacco dust, gave fair control of the cabbage worms. (4) Several brands of calcium arsenate, applied undiluted in the form of a dust, gave unsatisfactory control."

Insecticides control raspberry fruit worm.--S. E. Crumb, of the Puyallup, Wash., laboratory, reports as follows: "The most consistent and promising control was obtained by one application of spray containing acid lead arsenate (4 to 100), basic lead arsenate (1 to 300), or barium fluosilicate (4 to 100), followed by two applications of spray containing ground derris root having a rotenone content of 0.01 percent; or by two applications of any of the first three sprays mentioned, followed by one application of the derris spray. Fair control was obtained with derris root sprays containing 0.01 percent rotenone with or without nicotine sulphate (1 to 400), using a neutral caseinate spreader. The sprays containing anabasine sulphate 40 (neonicotine) or pyrethrum extracts, in general did not give satisfactory control. This first spray (in the two-spray and three-spray treatments), applied soon after the beetles of Byturus unicolor Say begin to emerge from hibernation, appears to be of doubtful value, at least in the Puyallup district."

Use of arsenicals on shade-grown tobacco in Georgia-Florida district decreased.--F. S. Chamberlin, of the Quincy, Fla., laboratory, reports: "Until recently the shade-grown tobacco industry in Georgia and Florida has used large quantities of paris green on the crop, mainly for the control of the tobacco flea beetle and the tomato worm. The poison was applied undiluted at the rate of approximately 1 pound per acre, with an average of about 12 applications for the season. During 1930, 22 samples of cured wrapper tobacco were found to contain an average of 2.55 grains of arsenic trioxide per pound. During the growing season of 1934, most of the fields of shade-grown tobacco received only two or three applications of undiluted paris green, made during the first 3 weeks of the growing period. Ordinarily these applications would not leave a harmful residue on the marketable portion of the crop.

Tobacco flea beetle controlled by derris or cube dusts.--Mr. Chamberlin also reports that derris or cube dust mixtures containing 1 percent rotenone gave good control of the flea beetle in lightly infested tobacco plant beds. Finely ground tobacco dust proved slightly preferable to kaolin as a diluent in these tests. Preliminary tests under field conditions have indicated that derris or cube dust mixtures, with 0.75 percent rotenone content, are effective against the flea beetle.

To prevent harmful residues on lettuce.--According to results obtained in preliminary tests conducted by K. B. McKinney, of the Tempe, Ariz., laboratory, spring lettuce plants that were dusted or sprayed from 35 to 40 days prior to harvest (before the heads began to form) did not contain any leaves that were included in the market product.

Hot-water treatments effective against grape mealybug on glads.--R. H. Nelson, of the Greenhouse Insects Laboratory, Washington, D.C., reports on hot-water treatments against the grape mealybug. A series of unhusked infested corms were treated in hot water at temperatures from 110° to 120° F., for varying lengths of time. The following treatments were found to be effective against all stages, including the eggs: 116° for an immersion of 1 hour, and 120° for 30 minutes. Naphthalene flakes have also been tried against this insect, using them as recommended for control of the gladiolus thrips (1 ounce per 100 corms), leaving the flakes in for 2, 3, and 4 weeks. In none of these tests was the treatment entirely effective. However, the mortality was high and the treatment holds some promise.

Hot-water treatments effective against bulb mite in tuberoses.--Tests conducted by R. H. Nelson and C. A. Weigel, of the Greenhouse Insects Laboratory, in the control of the bulb mite with hot-water and vapor-heat treatments, indicated that immersion in hot water for 60 minutes at a temperature of 110° F. is completely effective. No hatching was observed following the treatment. With the vapor-heat treatment, however, hatching occurred after a 1-hour treatment at 110° and 112°. At 110° a kill of only 66 percent of the mites was obtained. Hatching of treated eggs occurred after immersion for 30 minutes at 118°.

Hot-water treatments for control of bulb nematode.--Experiments by Randall Latta, of the Sumner, Wash., laboratory, and W. P. Courtney, of the Bureau of Plant Industry, on the control of the bulb nematode (*Anguillulina dipsaci* Kuhn.) gave the following results: Dilutions of formalin in the standard hot-water treatment at 110° F. showed that at that temperature formalin should be quite toxic to free-swimming nemas in a treatment tank. At dilutions of 1 to 200, all forms of active, revived, and dried quiescent nemas were killed in less than 40 minutes. At 1 to 400, active nemas survived treatments of 100 minutes but not of 120 minutes. Dried quiescent nemas were all killed in a treatment of 100 minutes, but 1 out of 310 revived following treatment for 120 minutes. A test was made to determine whether digging nema-infested stock before normal digging time would give satisfactory results. Bulbs were dug on June 8, and a sample from these treated for 1, 2, 3, and 4 hours at 110° F. at weekly intervals, starting June 11. Three weekly tests have been completed and the bulbs that remained in the ground until 3 days before treatment showed 100 percent kill after 1-hour treatment or longer, not including the heating period of the bulb. The bulbs taken from storage, however, showed increasing revival of nemas as the duration of the curing period increased.

INSECTS AFFECTING MAN AND ANIMALS

Heavy screw worm infestations in Georgia.--R. A. Roberts, of the Uvalde, Tex., laboratory, is temporarily stationed at Savannah, Ga., where he is assisting W. E. Dove in collaborating with the State entomologist in handling problems connected with the screw worm outbreak in that region. Infestations of livestock are heavy in the coastal counties from Camden north through Brantley, McIntosh, Long, and Liberty Counties with between 1,000 and 2,000 cases in Brantley County, and urgent requests for assistance have been received from State authorities. Arrangements are being made whereby the State will receive assistance from the F.E.R.A. in the control program.

A flytrap for stable flies.--W. G. Bruce, of the Ames, Iowa, laboratory, has continued his tests of various adaptations of traps designed to catch the stable fly. Large numbers of flies have been trapped, but there has seemed to be no appreciable reduction of the number attacking horses and cattle, probably because of the intermittent feeding habits and continued emergence of the flies. The trap is designed to catch the flies while the host animal walks through it.

Trapping flies in armadillo burrow.--A. W. Lindquist, Uvalde, Tex., reports some interesting results from the exposure of meat in armadillo burrows. From liver baits so exposed Sarcophaga was reared. From rabbit meat a good number of Synthesiomyia nudiseta V. d W. were recovered. The parasite Brachymeria fonscolombei Duf. has been recovered from two underground bait jars. More flies have been bred from the underground exposures than from those aboveground.

Derris controls goat lice.--O. G. Babcock, of the Sonora, Tex., laboratory, reports a complete kill of goat lice on a limited number of animals by dipping them in a pine-oil extract of derris. An acetone extract of derris was also effective. At the time the report was made sufficient time had not elapsed to determine the effect upon goat-louse eggs.

FOREIGN PLANT QUARANTINES

Recent entomological interceptions of interest.--A living adult of Cylas turcipennis Boh. was intercepted on June 10 at Boston in a sweetpotato in stores from India. This represents our first interception record of this weevil arriving from India. A larva and adult of Acythopeus gilvonotatus Barber were intercepted at San Francisco in an orchid (Phalaenopsis stuartiana) in cargo from the Philippines. The specimens were alive and were boring in the root and crown of the plant. Living larvae of Brachycerus albidentatus Gyll. were intercepted in June at New York in squill (Scilla sp.) bulbs in cargo from Italy. Although this insect has been taken in garlic from Italy and Spain and in cipollino from Morocco, this represents our first record of its arriving in squill. A living adult of Monocrepidius bifoveatus Palis. was intercepted at New Orleans on a pineapple in cargo from Cuba. A specimen of Neoconocephalus affinis Beauv. was taken at Baltimore on banana debris in cargo from Cuba. This species is not recorded from continental United States. The earwig Proreus simulans Stal was intercepted October last at Honolulu, Hawaii, on a pineapple plant in the mail from the Philippines. A specimen of Draeculacephala lenticula Ball was taken at Philadelphia with banana debris in cargo from Honduras. Four living larvae of Conotrachelus aguacatae Barber were intercepted at El Paso in an avocado seed in baggage from Mexico. A living adult of Aeolus pulchellus Cand. was intercepted at Hidalgo, Tex., in a sorghum stem in baggage from Mexico. A living larva of Gnorimoschema operculella Zell. was intercepted at New York last April in a tomato in stores from Belgium. This insect was taken in tomato at San Pedro, Calif., in 1930. Living specimens of Bactrocera cucurbitae Coq. were intercepted last May at San Pedro, Calif., in tomatoes in stores from Hawaii. Of 100 pounds of tomatoes examined, 15 pounds were found to be infested.

Recent pathological interceptions of interest.--A mango from Cuba was intercepted at New York on July 8 and found to be disfigured by Leptothyrium pomi, our first interception of this fungus on mango. Oat straw from Mexico intercepted at Eagle Pass on June 22 was infected with Puccinia coronata, our first interception of crown rust from Mexico. Our first interception of Sclerotium cepivorum from the Azores was made at Boston in garlic on June 27. Our first interception of Peronospora schleideni was made at Baltimore on July 16 on leek leaves from Japan. Botrytis sp., Pleospora sp., and Heterosporium sp. were found in the same material. Our first interception of Phytophthora phaseoli was made at El Paso in string beans from Mexico on July 13. New York inspectors found brown rot (Monilia sp.) on July 14 affecting cherries from Sweden. The only previous interceptions of brown rot on cherries were from England and Portugal, both in 1933. Pussy willow cuttings from Germany were intercepted at Philadelphia on March 17 and were found to be infected with Discella carbonacea. A disease of Dracaena sp. intercepted at Philadelphia last April 18 in plants from Japan has been determined as due to Gloeosporium polymorphum. A shipment of Aglaonema cuttings, brought in as baggage, was inspected at Seattle June 4. Among other fungi and diseases was an undetermined species of Physalospora of which no species had been previously reported on this host, and a species of Gloeosporium that does not agree with any species reported on this or related hosts. Gloeosporium sp. was found on Daphne leaves from Japan at Seattle on April 12. No Gloeosporium has previously been reported on Daphne. Rhododendrons from England were inspected at Seattle on April 24 and were found infected with Ascochyta sp. (spores too narrow to be A. rhododendri), Gloeosporium rhododendri, and Phyllosticta saccardoi. A disease intercepted on Camellia japonica from Japan at Seattle April 12 was determined as Phoma (?) camelliae Pass., not reported from Japan; no specimen in the herbarium for comparison. A diseased tomato from Mexico intercepted at Mobile on April 21 was infected with Helminthosporium sp. differing from species previously reported on tomato.

Insect parasites baffle inspector.--A recent insect interception at San Ysidro, Calif., provided a neat little surprise for the inspector there. A brown larva of some lepidopterous insect unknown to him was found in a cactus plant coming from Mexico. Intending to send it in for identification, he stored it carefully in a vial, but was astounded to find at mailing time that the larva had disappeared and in its stead were now several small maggots, no doubt parasites that had developed in and destroyed the original find. It is now impossible to determine the intercepted insect unless the identity of the parasites will furnish some clue to the vanished host.

Even cacti carry insects and diseases.--Shipments of plants from foreign countries are, as a rule, inspected very carefully at time of entry to determine whether they carry insects and diseases. A shipment consisting of 6 cases containing 1,004 plants of numerous species and varieties of cacti, which many people would consider quite unattractice to pests of any kind, arrived from Mexico on July 9 and was examined in San Francisco. The inspection disclosed 59 insect infestations, involving at least 24 different species occurring on 34 species of cacti in the shipment, and in addition 1 infection of a plant disease. Although practically all the pests found are known to occur in this country, this instance is an excellent illustration of the number and variety of pests that may be found even in such apparently clean plants as cacti.

Confirming the need for careful border inspection.--Recently a truck came through Presidio, Tex., carrying a family from Gerrero, Mex., en route to Ojinaga, Mex., and a few days later the same truck made the return journey. On inspection several locks of cotton were found in it, said to be from Zapata, Tex., but these showed no evidence of infestation. However, on opening a bag on the truck in which a saddle was packed, some 20 locks of cotton were found in the bottom, every one infested with pink bollworm. The driver stated that the bag had been bought to pack the saddle at Ojinaga. The inspector's identification of the insect as the pink bollworm was, as usual, confirmed by specimens submitted to Washington.

DOMESTIC PLANT QUARANTINES

Transit inspection.--Owing to the increasing amount of material, restricted by Federal plant quarantines, that is being carried by air express, information as to the routing of planes in the region of Philadelphia, New York, and Boston is being obtained to determine whether the movement is from the regulated areas to points outside. At the Chicago Municipal Airport, mail and express shipments arriving from eastern States are again being observed. But for the alertness of employees of the Philadelphia Ninth Street Post Office, a recent air-mail shipment of cut flowers of gladiolus might have proceeded from Philadelphia to Portland, Oreg., without Japanese beetle certification. After they had refused to accept the uncertified flowers for mailing, the package was later found and the transit inspector notified. The inspector arranged to have the flowers examined and certified and the package was then allowed to proceed. A recent tabulation of the number of shipments requiring inspection at each transit inspection point for each quarantine violation discovered, shows that inspectors at points near or within a quarantined area are, in general, more likely to find violations as a result of a much smaller number of inspections than those farther away. More shipments have been inspected at St. Paul for each violation than at any other point. The inspector there has had to examine 2,396 shipments for each violation found. At Boston, on the other hand, a violation may be expected in one out of 199 shipments, judging from the average since inspection was instituted in 1931. Averages for the other principal inspection points, as computed from figures in the annual reports, are listed below in ranking order: Washington, D.C., 331; New York, 417; Jacksonville, 619; Chicago, 802; Seattle, 802; Omaha and Council Bluffs, 835; Albany, 960; Philadelphia, 1,042; Pittsburgh, 1,203; Portland, Oreg., 1,208; Kansas City, Mo., 2,081; and Spokane, 2,136.

The inspection of cars arriving at Chicago from the Japanese beetle area has been continued in July and August, and living beetles have been found in several cars containing produce, or cars that have been emptied. Such cars have been cleaned or fumigated. The practice of taking specimens of plants involved in violations of the Japanese beetle quarantine has been discontinued wherever someone is available and willing to witness the interception and who is sufficiently impressed with the violation to recall it if necessary. This quarantine covers a wide range of plant material and the specimen is seldom called for in settling a controversy with the shipper. In the gypsy moth quarantine, however, the sampling practice is continued, as only woody plants are restricted, and this is also necessary in quarantines applying to pines, currants, gooseberries, mahonias, barberries, narcissus bulbs, poplar, and willow. Instructions on the subject are contained in circular 47-T to transit inspectors.

Phony peach disease.--Arrangements are being made by G. W. R. Davidson, Atlanta, Ga., to assist the Missouri State inspectors in the inspection of the vicinities of the principal peach nurseries in the State. The Canadian phony peach quarantine was revised on May 9, according to a recent announcement in a railway circular. Shipments of the host plants from any part of the United States require certification as originating in a disease-free nursery, with disease-free environs within 1 mile of the nursery; also each tree or root must have been examined and found free from the peach borer. Further, fresh peaches and peach nursery stock or pits are prohibited importation, as heretofore, into British Columbia from all States east of and including Wisconsin, Illinois, Missouri, Arkansas, and Texas.

White-pine blister rust.--Vehicular inspectors of the Japanese beetle force, stationed at roadside points, have reported the interception during June and July of 26 auto tourists carrying white pines from such generally infested States as New York, Pennsylvania, and the New England States, principally to points in Indiana, Ohio, and Michigan. Some 140 pines were being carried in this manner, one tourist having as many as 40. All the 140 were surrendered at the inspection stations and were destroyed by burning.

CONTROL INVESTIGATIONS

With the installation of the six steel gastight outer doors on the El Paso fumigation plant, the original 19 projects for physical improvements on the Mexican border for the Division of Foreign Plant Quarantines will be completed. This last project was 95 percent completed on July 31. Another project, for the construction of a system for ventilating the fumigation house at Laredo and disposing of the hydrocyanic acid after fumigation, is under way, using funds recently reallocated by the Public Works Administration. The gas will be exhausted from the fumigating chambers by means of four blowers. Each blower has a capacity of 6,000 cubic feet of air per minute and is connected with a steel stack 110 feet high. The system should clear the fumigation chambers of hydrocyanic acid so that it will be safe to enter in 20 minutes.

Bids for the construction of two mushroom houses, a greenhouse laboratory with four greenhouses, and a main laboratory building at Beltsville, Md., were opened on July 27 and it is expected that the contract will soon be let, as the bids were satisfactory.

A series of pictures to show the effect of feeding of the Japanese beetle on fruit trees in the heavily infested area of southern New Jersey, was taken from an autogiro. The photographs plainly show the foliage injury resulting from the feeding. A colored motion picture, which brings out markedly the difference in color of the injured and uninjured foliage, was also taken.

Gelatin films aid in study of effect of light on derris powder.--M. C. Swingle and F. L. Campbell, Takoma Park, Md., report that preliminary experiments indicate that the detoxication by light of derris powder in thin deposits can be studied quantitatively by exposing to light gelatin films in which derris powder is embedded and by feeding to imported cabbage worms exposed and unexposed films in cabbagge-leaf sandwiches. Derris powder in gelatin films acts as a stomach poison against the imported cabbage worm, which is killed when it feeds on the unexposed film and is not affected by crawling over the film.

Insecticidal value of Cracca virginiana.--Mr. Campbell and W. N. Sullivan, Takoma Park, state that tests against house flies of acetone extracts of 127 samples of *Cracca virginiana* roots from 13 States indicate that the most effective samples are likely to be found in southern Georgia and in Florida and Texas. In every instance effective extracts gave an unmistakable blue color when submitted to the Durham test, whereas ineffective extracts gave little or no blue color.

BEE CULTURE

Calcium arsenate dust is fatal to bees.--George H. Vansell, of the Davis, Calif., laboratory, reports that, within 4 hours after airplane dusting of tomatoes in that vicinity, adult bees were dying at an alarming rate. The dust, calcium arsenate, was applied to the tomato plants, which were not visited by the bees to any extent. The adjoining fields, however, were full of blossoming morning-glory and mustard plants from which the bees were gathering nectar. Within a few days the colonies were practically devoid of unsealed brood. The loss of adult bees was exceedingly heavy--so heavy, in fact, as to cause starvation of much of the brood that escaped poisoning. An analysis of the dead bees showed an arsenic content of 55 parts per million, and pollen taken from the hive showed 50 parts per million. Investigation by officials of the University of California disclosed that the airplane dusting was done without permit; the insects in the tomato fields would not warrant dusting at the time; and the coverage on the tomatoes was so poor that dusting would have been ineffective, irrespective of the condition of the insects.

IDENTIFICATION AND CLASSIFICATION OF INSECTS

Florida pepper weevil changes name.--During the early part of 1934, J. R. Watson and F. S. Chamberlin submitted for identification specimens of a cryptorhynchid weevil found injuring pepper plants in Dade County, Fla. The species was at first considered by L. L. Buchanan, who examined them, to be undescribed, though very closely related to a Brazilian species, bred from tobacco stems, which was described by Marshall in 1925 as *Collabismodes tabaci*. More recently, information received by Mr. Watson from S. C. Bruner, Havana, Cuba, has brought out the fact that the Florida specimens are identical with a Cuban species described by Boheman many years ago as *Cryptorhynchus cubae*. The species should be removed from the genus *Cryptorhynchus* to *Collabismodes*, therefore the name of the Florida pepper weevil becomes *Collabismodes cubae* (Boh.).

Works on tabanids.--James M. Brennan worked from July 20 to August 10 at the National Museum on Tabanidae of the subfamily Pangoninae, in connection with his revision of the nearctic species of this subfamily.

Cicadula maidis found on corn in California.--Specimens identified by P. W. Oman as *Cicadula maidis* DeLong and Wolcott were sent in for determination from Temple, Los Angeles County, Calif., July 25, 1934, by R. E. Campbell. Mr. Campbell reports that "adults were very numerous on mature corn, on which there was considerable honeydew and sooty mold fungus. Young corn near by, 6 to 12 inches high, was infested with from 4 to 20 adults each, the leaves showing injury and the plants appearing stunted." This appears to be the first record from continental North America of this species reported as a pest of corn and a possible transmitter of mosaic disease in Puerto Rico and Cuba. In addition to the West Indian specimens, the National Museum collection contains a single specimen from Vicosa, Minas Geraes, Brazil.

Beet leafhopper identification.--Sometime ago, in checking over the species of leafhoppers described by Haupt in "Homoptera Palestinae 1" (Bull. 8, Zionist Organ. Inst. Agr. and Nat. Hist. 1927), P. W. Oman noticed that the excellent figures of the male plates and internal male genitalia of *Thamnotettix indivisus* Hpt. represented very well these structures in the common North American beet leafhopper (*Eutettix tenellus* Bak.). Consequently, specimens of *E. tenellus* were sent to Haupt for comparison with *T. indivisus* and he has recently reported that they are the same. Because of the possibility that Haupt's specimens may have been erroneously labeled as to locality, it seems inadvisable to publish this fact without confirmation through the collection of additional specimens in Palestine. If this distribution proves to be correct, it will undoubtedly be of considerable importance in future investigations of the beet leafhopper.

Specimens of *Geisha distinctissima* Walk. have been identified by P. W. Oman, from Seattle, Wash. (Nos. 3964 and 3969), reported as intercepted alive in quarters on *Aralia* and *Euonymus* from Japan. Specimens on *Euonymus* were last-instar nymphs; those on *Aralia* were adults. *G. distinctissima* is a fulgorid resembling the North American *Ormenis venusta* Melichar. Matsumura has reported (Ent. Nachr. 26, p. 213, 1900) that this species often causes much damage to mulberry, *Prunus*, tea, and *Diospyros kaki* (persimmon) in Japan.

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ADMINISTRATION

Chemical work on insecticides transferred to this Bureau.--By administrative order, Secretary Wallace transferred effective September 1 the Division of Insecticides and Fungicides from the Bureau of Chemistry and Soils to the Bureau of Entomology and Plant Quarantine. In making the transfer the Secretary stated that its purpose was "to bring about a closer coordination of research along related lines." The studies involved in the Department's intensive search for insecticides that will leave no residue harmful to man on the harvested product require close coordination of the activities of chemists and entomologists. The chemical work on insecticides and fungicides continues its identity as a division with R. C. Roark in charge. Doctor Roark and his assistants in administrative work have been transferred to space assigned to the Bureau of Entomology and Plant Quarantine in the South Building on the fifth floor. The laboratory investigations carried on in Washington for the present continue to be housed in the old building of the Bureau of Chemistry and Soils, and the workers conducting them will be moved along with the chemists of the Bureau of Chemistry and Soils to the South Building when the space arranged especially for laboratory investigations is available.

FRUIT INSECT INVESTIGATIONS

Codling moth parasite Ascogaster carpocapsae colonized in new areas.--As a part of the codling moth program of the Moorestown, N.J., laboratory, has been the propagation of Ascogaster carpocapsae Vier. for colonization in areas in which it has not been known to occur, chiefly in the West and Middle West, material was gathered in the orchards near Moorestown, N.J., and mass rearing was carried on in the laboratory with the oriental fruit moth as the host. The parasites were shipped host-free, in the adult stage. H. W. Allen, in charge of this work, reports that during the months of June, July, and August 30 shipments, containing 39,100 adults, were made to Arkansas, California, Colorado, Georgia, Idaho, Kansas, Mississippi, Montana, New Mexico, and Oregon. Nearly all were forwarded by air express from Camden to the airport nearest the designated station, the trip being completed by rail. A few of the shipments to nearer points were made in refrigerated containers by railway express. The results were surprisingly good. No shipment failed, except one allowed to remain in the express office for 3 days. The mortality in most shipments was under 10 percent, and in many it was less than 1 percent. Most of the liberations were made at a time quite favorable for establishment of the parasite in the second brood of codling moth.

Results in control of plum curculio on peach.--Oliver I. Snapp and J. R. Thompson report very interesting and encouraging results from large-scale peach spraying and dusting experiments for the control of the plum curculio (Conotrachelus nenuphar Hbst.) at Fort Valley, Ga., this year. Barium fluosilicate gave the best results. The following table summarizes briefly some of the most important results of that work. In order that the degree of curculio control from the several treatments could be more accurately measured, no supplementary control measures were enforced in the orchard in which these experiments were conducted.

Treatment	Total fruit infested with curculio
	Percent
Barium fluosilicate spray	14.6
Trees jarred 17 times during season in lieu of insecticide	20.0
Cryolite spray	21.5
Lead arsenate spray	30.0
Check (untreated).......	47.9

MEXICAN FRUIT FLY CONTROL

Second consecutive month with no Mexican fruit flies taken in Texas.--Some 8,000 traps were operated on 599 premises in August, the greatest number of traps in operation at any one time since this phase of the work has been carried on. The trapping program was changed somewhat at the beginning of the month, providing for the placing of more traps in the individual groves, which will be trapped for 5 weeks only, rather than for 3 months as has been the practice heretofore. No Anastrepha ludens Loew were taken on the Texas side of the Rio Grande during the month, making the second consecutive month to elapse without finding some stage of this species. This negative showing in the face of the intensive trapping carried on would indicate that the population of this species is at a very low ebb. However, there was an increase in the number of the other species commonly taken, 45 adults of A. pallens Coq., 18 of A. serpentina Wied., 6 of A. fraterculus Wied., 1 of Anastrepha sp. "Y", and 2 of Toxotrypana curvicauda Gerst. being taken in the traps. Specimens of A. serpentina, A. fraterculus, and A. pallens were taken in traps located in brush. Two of the A. fraterculus were taken in such traps northwest of Raymondville, being the first of this species ever taken in Willacy County.

Fewer fruit flies trapped in Matamoros, Mex.--There was a decided decrease in the number of adult fruit flies trapped in Matamoros and also in the number of larvae recovered from imported fruit. Only 9 adults of A. ludens were trapped, although in view of the large number of larvae recovered from imported fruit in July, it was expected that numerous adults would be trapped in August.

Larvae of *A. ludens*, *A. serpentina*, and *A. fraterculus* were taken in small numbers from imported fruit on the market. An adult reared by the Mexican inspector from Manila mangoes originating in the State of Vera Cruz was tentatively identified by specialists in the National Museum as *A. acidusa* Walk., the species commonly found in the West Indies, rather than *A. fraterculus*, of authors, the species common in Mexico.

CEREAL AND FORAGE INSECT INVESTIGATIONS

Parasite of the sugarcane mealybug recovered after 2 years.--During August and September, E. K. Bynum recovered *Pseudococcobius terryi* (Full.), the Hawaiian parasite of the sugarcane mealybug(*Pseudococcus boninsis* Kuw.), at Houma, La., Cairo, Ga., and Belle Glade, Fla., in fields in which releases were made in 1932. Releases have been made from recovered material at Canal Point, Fla., and on another property near Cairo, Ga.

Vetch seed in Oregon shows no bruchids.--L. P. Rockwood and T. R. Chamberlin, Forest Grove, Oreg., report that at various times during the month (August) hairy, Hungarian, and common vetch seed was examined at cleaning mills at Monmouth, Perrydale, Albany, and Forest Grove, all in Oregon. No infestation by any of the bruchids was found.

Infestation by wheat jointworm unusually low.--Mr. Chamberlin also reports that samples from seven fields in the heart of and around the borders of the Lebanon, Oreg., jointworm colony (all that have been taken to date) showed no infestation by *Harmolita tritici* Fitch. A large sample taken from a field in the vicinity of the sample farm in the Molalla district also showed no infestation. Of all the fields examined in both the Lebanon and Molalla colonies, only one has shown an infestation above 6.5 percent. This was in a field of winter wheat near the southern edge of the Molalla colony, adjoining a field of infested stubble with no fence row or other barrier between. The average infestation of samples taken from this field in July and August was 41 percent.

Parasitization of western spotted cucumber beetle increases in August.--Mr. Chamberlin reports further that dissection of adult beetles taken late in August showed a parasitization by *Celatoria diabrotica* Shimer of 30.4 percent and none by nematodes. The highest parasitization previously found in this year's generation of beetles by *C. diabrotica* was 8.7 percent. Only a few female beetles were in the sample and none of these showed egg development.

Alfalfa weevil population at low ebb in Nevada.--G. I. Reeves, Salt Lake City, Utah, reports: "A preliminary survey of the Fallon, Nev., area shows that the adult alfalfa weevil population has been greatly reduced during the past season, populations in the fields examined ranging from 0 to 0.38 adults per square foot. This low adult population points toward a 1935 season free from economic damage at Fallon. At Reno the adult weevil populations range from 0.31 to 1.81 per square foot. At Fallon cocoons containing *Bathyplectes curculionis* (Thompson) average 10.89 per square foot, with 4.21 percent containing living *Bathyplectes* larvae. The average for Reno is 28.59 per square foot, with 8.09 percent viable. In other areas the adult weevil population ranges from 1.41 per square foot at Salt Lake City, Utah, to 3.48 per square foot at Salina, Utah. Cocoons of the parasite Bathyplectes curculionis are plentiful throughout the weevil territory so far examined, and are being continually recovered at Medford, Oreg., where they were colonized last spring."

JAPANESE AND ASIATIC BEETLE INVESTIGATIONS

Spread and intensity of continuous Japanese beetle infestation.--H. Fox, Moorestown, N.J., reports that the area of continuous infestation in 1934 may be provisionally estimated at 9,700 square miles, an approximate increase within the year of 900 square miles. Distribution by States is as follows: New Jersey, 6,160 square miles; Pennsylvania, 2,600 square miles; Delaware, 660 square miles; Maryland, 120 square miles; New York, 160 square miles.

Public service patents for Japanese beetle traps.--Public service patents, numbered 1968953 and 1968954, covering two types of Japanese beetle traps, were granted on August 7 to F. W. Metzger, Moorestown, N.J. The granting of these patents should greatly facilitate the manufacture of traps, in that these devices can now be made without danger of royalty claims by holders of private patents.

Insecticides tested against the Japanese beetle.--W. E. Fleming and F. E. Baker, Moorestown, report that during the season 75 different materials, alone and in combination, were tested at different concentrations under controlled conditions, to determine the value of these materials as stomach-poison insecticides for the Japanese beetle. In conducting these experiments almost 2,000 tests, each test being made with 200 freshly collected beetles, were made. During the season 400,000 beetles were used in these experiments. It is apparent that paris green and its homologs--copper lauro-arsenite, copper oleo-arsenite, copper stearo-arsenite, etc.--are less effective than acid lead arsenate in killing the beetle and cause more extensive damage to foliage. Natural cryolite, even when used at the rate of 32 pounds to 100 gallons of water, did not prevent the beetles from feeding extensively on the foliage and caused no mortality. Cuprous cyanide, even when used at the rate of 32 pounds to 100 gallons of water, was only 78 percent as effective as 8 pounds of lead arsenate in killing the beetles. Hellebore and pyrethrum were of no value as stomach poisons against this insect.

Derris protects fruit from Japanese beetle.--Derris was found to be one of the best materials for protecting fruit and foliage from attack by the Japanese beetle. The rotenone and deguelin appear to be the effective constituents. Tephrosin, toxicarol, and the resinous residue of derris were of very little value. When derris is used at the rate of 3 pounds to 100 gallons of water, the beetles feed to a limited extent on foliage but few are poisoned. The derris appears to be effective as a repellent rather than as a stomach poison. Derris, even when applied with the common stickers, appears to be readily removed by washing. The exposure to ultraviolet rays, even for 24 hours, did not appear to reduce the effectiveness of derris, although the effectiveness of derris in the field is caused by the removal of the residue from the foliage by means of rain, dew, and wind, rather than by the decomposition of the material in the presence of light.

Collection and distribution of Japanese beetle parasites.--M. H. Brunson, Moorestown, reports that a greater number of female *Tiphia popilliavora* Roh. were collected this season for liberation than have been collected during any one season in the history of the insect in this country. During August 18,767 females were collected at Lansdowne, Noble, and Langhorne, Pa., by five men in 15 days, the average rate of collection being 257 females per man per day. The cost of collection averaged 1.5 cents per female. During the month, 176 colonies, consisting of about 100 females each, were liberated in the areas in Pennsylvania, New Jersey, Delaware, and Maryland that are heavily infested by the beetle.

Experiments with Tiphia on Japanese beetle.--L. B. Parker, Yokohama, Japan, reports, in connection with studies of the parasitization of the Japanese beetle by the imported species *Tiphia tegitiplaga* Allen and Jaynes, that the results, while not considered conclusive, indicate that the progeny of second-generation parent *Tiphia* reared on grubs of *Popillia japonica* Newm. are not true *Popillia* parasites, although in the laboratory this host was readily acceptable to the parent females.

Dexia ventralis as a Japanese beetle parasite.--T. R. Gardner, reporting on studies with *Dexia ventralis* Ald., an imported parasite of the Japanese beetle, states that from July 31 to August 10, 20 *D. ventralis* females were collected at the Haddonfield, N.J., colony and were used in the laboratory for propagation work. At the end of August these females had parasitized 2,009 Japanese beetle grubs, averaging over 100 grubs per female, and 13 of the flies were still alive and were larvipositing. On August 14, 1,008 grubs parasitized by *D. ventralis* were placed in a pasture near Elkton, Md., where Japanese beetle grubs were abundant and where *Phyllophaga* grubs were moderately abundant.

Electric light traps for the Asiatic garden beetle.--H. C. Hallock and I. M. Hawley, reporting on tests against the Asiatic garden beetle on Long Island and in New Jersey, state that trap light tests were conducted using two types of traps and lights of the following type: 100-watt daylight bulb, 500-watt daylight bulb, G-5 mercury vapor lamp, ultraviolet lamp, and a neon lamp. The G-5 lamp was found the most effective in attracting beetles to the traps. The 500-watt lamp was so bright that it did not prove effective in the traps with a smaller baffle used in 1934, though in the traps with large baffles and a large funnel used in 1933, nearly as many beetles were caught as when the G-5 lamp was used. The 100-watt daylight lamp with a small trap should prove very effective for small property owners. On good nights this trap has caught as high as 2,000 beetles in an hour.

JAPANESE BEETLE CONTROL

Fruit, vegetable, and cut-flower inspection at seasonal level.--Produce submitted for Japanese beetle inspection in Philadelphia consisted principally of consignments to summer estates in Maine, provisions for ships' stores on vessels sailing from Philadelphia to nonregulated ports of the United States, and, occasionally, of wholesalers' shipments to distant markets where higher prices prevailed. Japanese beetles were still being removed from inspected material, particularly greenhouse-grown cut flowers and freshly picked beans. Inspection of farm products showed a decided increase in both Baltimore and Salisbury, Md., due principally to large shipments of beans and peaches. Most of the beans originated on infested farms, necessitating careful inspection of each hamper. There was also a noticeable increase in shipments of cut flowers from the Baltimore wholesale houses.

Cessation of Japanese beetle flight.--By the middle of August flight of the adult beetle had subsided throughout New Jersey and the Philadelphia area. Similar conditions were reported from all other sections where there was heavy population of the insect. Complaints of beetle injury in flower gardens in New York City and Brooklyn and in adjoining counties were less frequent. Passing of the peak infestation early in August, together with lower temperatures, contributed to the reduced populations. Late in August inspectors in the New York area were still finding beetles in blooms of roses, hollyhocks, silverlace vine, and other blooms examined in sections that had been infested for 2 years or more. A garden club at Dongan Hills, Staten Island, requested advice and assistance in combating the beetle. At the close of the adult beetle's maximum flight period in the riverfront and market districts of Philadelphia, the regular schedule for inspection of fruits and vegetables was resumed at the inspection platform. This year's heavy adult flight lasted nearly 5 weeks, from July 11 to August 13.

Large quantity of potting soil fumigated.--Carbon disulphide fumigation of 515 cubic yards of potting soil was made for a large nursery in central New Jersey in August.

Floating Japanese beetles washed up on Long Island.--At high tide on August 10, Japanese beetles were washed ashore at Long Beach, Long Island. The insects formed a thin line on the beach, but bathers were so numerous that the beetles were trampled into the sand nearly as fast as they were washed ashore. Apparently an offshore breeze over New Jersey had carried the swarming adults out over the ocean during the week, and a day or two later the dead beetles were carried in with the tide to be deposited on the shores of Long Island and Staten Island. There were no infestations in New York City or Brooklyn that reached the swarm stage, but numerous requests were received by the New York City office for information on the control of Japanese and Asiatic beetles.

Few beetles trapped at old infestation in Springfield, Mass.--Japanese beetle trapping by the park department at Springfield, Mass., resulted in the capture of 45,000 beetles. Last year 36,000 beetles were caught in the same area. One encouraging feature of the control work is that very few beetles were caught in the traps placed in the sections which several years ago received lead arsenate treatments. In West Springfield, where some 5,000 beetles were trapped last year, the traps collected only approximately 2,000 beetles. As was the case in Springfield, practically no beetles were caught in the traps operated in the sections previously poisoned with lead arsenate.

Mobile patrolman to prevent contraband moving from Syracuse.--To forestall the removal of uncertified quarantined articles from the Japanese beetle quarantined zone in the vicinity of Syracuse, N.Y., an inspector with an automobile was assigned to patrol the principal highways leading from the regulated territory. A large number of truckers who were disregarding the certification requirements were turned back to the Syracuse inspection platform, where their loads were inspected and certified.

Japanese beetle inspected cut flowers shipped to distant States.--Cut flowers shipped under certification from the Philadelphia wholesale houses in August consisted principally of roses and gladioli destined to points in the Carolinas, Georgia, Florida, West Virginia, Ohio, and Michigan. Notwithstanding rather unfavorable market conditions there was an increasing demand from nonquarantined States for the general line of cut flowers handled by the Philadelphia wholesalers.

Barge loads of sand fumigated for movement to Midwest.--Three barges, with a combined capacity of 1,500 cubic yards of molding sand, were fumigated with carbon disulphide for Japanese beetle control after loading at Millville, N.J. The fumigant was used at the rate of 1 pound per cubic yard. The barges were for delivery to Midwestern points via the Great Lakes.

First-record Japanese beetle infestation at Chicopee, Mass.--Nursery and greenhouse scouts located two adult Japanese beetles within 500 feet of a nursery at Chicopee, Mass. This was the first indication of the insect's presence in Chicopee or vicinity.

Gypsy moth inspection in pulpwood clearance.--One of the largest pulpwood operations in central New Hampshire has involved the clearing of approximately 500 acres of woodland to produce 5,000 cords of this type of forest product. It is estimated that the 100 men engaged in this work have cut 50,000 trees, half of which are spruce and the other half fir. Gypsy moth inspection was made on a lot basis, the entire cut-over area having been thoroughly scouted and found free from infestation.

Gypsy moth inspections increase.--The month of August was a busy one for practically all district inspectors in the New England territory. Inspection of pulpwood and lumber increased in volume. Many infested shipments were found. While inspecting two carloads of rough-edge lumber at Meredith, N.H., the inspector found 43 gypsy moth egg clusters in one car lot and 39 on the lumber in the second consignment. At Eaton, N.H., the inspection of two additional cars of lumber disclosed 22 egg clusters in the first and 14 in the second lot examined. During an unusually busy week in the Concord, N.H., district, the inspector certified 251 tons of rough granite, 356 pieces of building and monumental granite, 147 ash logs, 46 crates of blueberries, and a small quantity of beans. The latter two items were certified under the Japanese beetle quarantine. Four egg clusters were removed from two of the last-mentioned granite shipments. Most of the paving companies in the Bangor, Maine, district are running with full crews. Pulpwood shippers in the vicinity of Bangor expect to move large quantities of this product. Granite shipments from the Quincy, Mass., district were very good for this season. A quarry at East Weymouth, Mass., started on a 15-carload order for seam-faced granite to be used in the construction of a new church at Mt. Lebanon, Pa.

Stored lumber infested with gypsy moth.--Last spring a lumber company operating portable sawmills in the Portland, Maine, district contracted to deliver one million board feet, or from 80 to 85 carloads of round-edged lumber to Brooklyn, N.Y. This lumber was sawed in woodland heavily infested with gypsy moths. As there were no open fields or pastures available in the vicinity of the woodlots, the lumber was yarded to dry on the lot where it was sawed. During the past summer large quantities of egg clusters have been deposited on the stored lumber. When shipped, the lumber will require a careful piece-by-piece inspection to rid it of egg masses. Had the lumber been yarded in an open field not surrounded by trees or shrubs, the probability of infestation would have been remote and a much less rigid inspection would have been permissible.

Connecticut attempts clean-up of local gypsy moth infestation.--Acting upon information supplied by the district inspector at Willimantic, Conn., the State superintendent of moth work has a crew of scouts engaged in eradicating an infestation of gypsy moths discovered in a private forest at Clarks Corner, in the northeastern section of the State. By the end of August, 125 gypsy moth egg clusters had been located over a rather wide range of territory. There are several carloads of cordwood to be shipped from this woodland area.

Quarry and nursery scouting for gypsy moth.--In the lightly infested gypsy moth area quarries and nurseries in sections not known to be infested were scouted for egg clusters. Determination of freedom from infestation of these establishments and their surroundings allow them to receive permits for their shipments without detailed inspection of each article.

Gypsy moth pupae found later than usual.--Living gypsy moth pupae were found in the Greenfield, Mass., district as late as August 6, when five of them were removed from lumber inspected for shipment to New York City. Usually by the middle of July adults have emerged from all surviving pupae and from then until early in September female moths may be found depositing their egg clusters.

Birch logs may spread gypsy moth infestation.--Summer visitors and campers in northern New England frequently ship home birch logs for fireplace decoration. An inspection of 12 such logs at Weirs, N.H., near Lake Winnepesaukee, disclosed 4 egg clusters. After all infestation had been removed, the logs were shipped under certification to Long Island, N.Y.

Scouting for satin moth.--Early in August district inspectors scouted areas beyond the borders of the area in the New England States designated as infested with the satin moth. Most of the observations gave negative results. Egg clusters of the satin moth were found in the towns of Linneus and Houlton, in Aroostook County, Maine. These towns are about 30 miles north of the area now under regulation for this insect. While scouting for satin moths in the town of Shelbourne, Coos County, N.H., two gypsy moth egg clusters were found on a willow tree near a garage and farm tourist home. This infestation, in a lightly infested gypsy moth area, appeared to have been spread in the caterpillar stage by a tourist traveling from a heavily infested camp to this uninfested district. By arrangement with the port inspection office at Seattle, Wash., an inspector was detailed from July 22 to August 12 to scout a tier of counties in central Washington east of the area in the State designated as regulated on account of the satin moth. Observations were confined to black cottonwoods and willows, the host trees of the insect in the Pacific Northwest. Although three weeks were spent in scouting an extensive area in Klickitat, Yakima, Kittitas, Chelan, and Okanogan Counties, all observations gave negative results. In the course of the survey many dead trees were observed along the Columbia River.

Corn borer damage in Connecticut.--Under the direction of the Connecticut Agricultural Experiment Station, a State survey of damage caused by the European corn borer is being made by three field men. This year's corn borer injury in the State extended over a much larger area than that of last season. An attempt is being made to determine the area in which severe commercial damage occurred.

FOREST INSECT INVESTIGATIONS

Survey of the Yellowstone Park bark beetle control project.--J. C. Evenden, of the Coeur d'Alene, Idaho, field laboratory, reports that forest-insect surveys are now being made of the Yellowstone Park and of the Teton, Targhee, Gallatin, and Beaverhead National Forests. These surveys, which are under the direct supervision of officers of the Coeur d'Alene laboratory, are for the purpose of determining the 1934 status of the mountain pine beetle infestation, which threatens to destroy the pine stands of these areas, and to learn whether the reopening of this project in the spring of 1935 will be feasible. Actual control work in connection with this project was discontinued in the spring of 1931, as the outbreak had reached such a magnitude that further control seemed inadvisable.

Weevil not primary in destruction of western white pine.--W. D. Bedard, of the Coeur d'Alene, Idaho, field laboratory, reports that the weevil Pissodes curriei Hopk., associated with the mountain pine beetle in western white pine, is not primary in its attacks. It restricts its attack to the base of the tree, and is most abundant just above and below the ground line in the root collar and large lateral roots. It was believed that this insect possibly attacked the tree 1 year prior to attack by the mountain pine beetle and that in association with various Armillaria fungi it was the primary agent causing the death of the tree. However, an examination of 127 infested trees indicated that the weevil attacked the tree the same year as did the bark beetle, and more detailed observations on 33 of these trees showed that the weevil deposits eggs from 3 days to a month after the bark beetle attack. In no instance were the weevils found in green pines, although 217 trees were examined, showing that they apparently attack only trees infested by bark beetles.

Parasites of the imported willow leaf beetle.--P. B. Dowden, of the Melrose Highlands, Mass., field laboratory, submits a table showing the results obtained from collections of pupae of the imported willow leaf beetle (Plagiodera versicolora Laich) taken at three points in the vicinity of Boston, Mass., during July and August. The purpose of these collections was to obtain data on the extent to which the pupae were parasitized by an accidentally introduced European hymenopteron, Schizonotus sieboldi Ratz. Freshly formed pupae of the beetle were collected and isolated in small glass vials and records were kept of the number that gave adults of the beetle and of the parasite. Some pupae gave neither, as the table indicates.

Place of collection	Date of collection	Pupae collected	Pupae giving Plagiodera	Pupae giving Schizonotus
		Number	Percent	Percent
Milton, Mass....	July 12	100	12.0	82.0
Do..........	19	100	18.0	57.0
Do..........	25	100	27.0	63.0
Do..........	Aug. 2	28	17.8	60.7
Do..........	9	59	0	84.7
Belmont, Mass..	July 10	26	19.2	46.1
Do..........	17	100	48.0	44.0
Do..........	24	100	30.0	62.0
Do..........	31	100	9.0	58.0
Do..........	Aug. 7	11	9.0	72.7
Saugus, Mass....	July 13	100	31.0	59.0
Do..........	20	100	17.0	68.0
Do..........	27	100	61.0	28.0
Do..........	Aug. 3	100	29.0	55.0
Do..........	10	20	45.0	45.0

Introduced parasites of European pine shoot moth recovered.--During 1934 two European hymenopterous parasites of the European pine shoot moth were recovered by the Melrose Highlands, Mass., field laboratory from points where adults obtained in Austria by W. F. Sellers had previously been put out. Tetrastichus turionum Hartig, first liberated in 1933, was recovered from colony sites in Brookline, Mass., and Matinecock, L.I., N.Y., and Orgilus obscurator (Nees), which has been liberated each year since 1931, was taken from colony sites in Brookline and Wakefield, Mass. The latter species was known to be present in the United States prior to 1931, being perhaps accidentally introduced with the European pine shoot moth, but its presence in Brookline and Wakefield is apparently due to liberations made there. Examinations of pine shoots infested with the European pine shoot moth indicate that during 1934 in the vicinity of Boston, Mass., a native hymenopterous parasite, Hyssopus thymus Gir., was responsible for the death of a large percentage of larvae that survived the winter.

Birch leaf-mining sawfly.--J. V. Schaffner, Jr., of the Melrose Highlands, Mass., field laboratory, spent August 13-17, inclusive, making observations on the birch leaf-mining sawfly (Phyllotoma nemorata Fall.) at points in Maine, New Hampshire, Vermont, and New York. He reports that along the route traveled he believes there is a general increase over last year's infestation. In certain designated areas collections of birch leaves are made to obtain data on the degree of infestation, and infested leaves are saved for parasite recoveries. The following table indicates an increase in infestation since 1933 in four of the six areas.

Observation point	Leaves collected	Leaves infested in 1934	Leaves infested in 1933
	Number	Percent	Percent
Bar Harbor, Maine....	13,685	11.28	14.87
Bethel, Maine........	5,749	14.79	9.69
Strong, Maine........	2,890	11.76	8.72
North Conway, N.H....	5,353	4.45	3.86
Bolton, Vt...........	5,689	13.49	3.72
Keene, N.Y...........	2,869	4.46	7.09

Weight increase of adult elm leaf beetle.--S. F. Potts, of the Melrose Highlands, Mass., field laboratory, finds that adults of the elm leaf beetle kept in cages increased in weight 2.3 times from the time when they emerged from pupae until they entered hibernation. At the beginning of this period of about 3 weeks, during which they were given elm foliage for food, their average weight was 5.7 mg. At the time they entered hibernation their average weight was 13.12 mg.

GYPSY AND BROWN-TAIL MOTH CONTROL

Spraying for gypsy moth did not kill deer.--During the month (August) a report reached the gypsy moth suboffice at Wilkes-Barre, Pa., that dead deer were being found in wooded areas adjacent to localities where spraying had been done in June by Federal crews employed on gypsy moth eradication work. The employees of the suboffice at Wilkes-Barre immediately contacted the State game refuge keeper in the district where the dead deer were supposed to have been found and were told that the keeper had received reports of a similar nature during the latter part of July and that on July 31 he, with an assistant, had made a thorough survey of the territory in question and was unable to find dead game of any description.

Gypsy moth in Columbia County, N.Y.--The New York department of conservation reports that a gypsy moth infestation, consisting of five egg clusters, was found in the town of Austerlitz in August. This town is located in Columbia County, N.Y., adjacent to the Massachusetts State line. Additional scouting will be done in the locality where these egg clusters were found and the necessary treatment will be applied.

Gypsy moth a blueberry pest.--Reports during the past summer have indicated that in some sections of Maine and New Hampshire there has been considerable injury to the blueberry crop by gypsy moth larvae, a condition never before reported. About the middle of July a report was received that gypsy moth larvae were causing much damage to the blueberry crop in the town of Dresden, in Lincoln County, Maine. Later reports from that section state that over an area of about 200 acres there is a heavy infestation, with many egg clusters on the berry bushes and in stone walls on or adjoining the area. A report published in one of the agricultural papers indicates that there was a heavy loss of the blueberry crop in sections of Belknap County, N.H. According to this report the injury by the gypsy moth, "in combination with the effects of dry weather and winter damage, has reduced the crop by hundreds, if not thousands, of bushels in Alton, Gilford, and other towns in that county."

PLANT DISEASE CONTROL

Phony peach eradication.--In cooperation with Louisiana State inspectors, two of the Bureau agents, engaged in the phony peach eradication work in Georgia, have been making a thorough inspection of all the peach trees they could locate in Bossier and Caddo Parishes, La. In certain portions of the two parishes, they found infections so severe as to cause this area to be considered "generally infected." In some instances the inspectors found rather alarming percentages of phony trees in young plantings, indicating that the trees must have been infected at the time they were planted. Some of these young plantings were made with trees purchased in middle Georgia. The inspection work was continued in 11 counties in Georgia and up to August 31, 1,281,046 trees located in 192 commercial orchards had been inspected. Of these, 27,107 trees were found to be infected. In addition to inspection of commercial orchards, 17,287 trees scattered through 955 home orchards were inspected. Of this number, 1,809 trees were "phony", making a total of 28,916 peach trees found to be infected with the phony disease this season in Georgia.

Correction.--In the News Letter reporting activities for July (vol. 1, no. 2, pp. 10-11) it was erroneously reported that during inspection work this season in Texas 69,545 infected trees had been found in commercial orchards and 12,609 phony trees in home orchards. The above figures represent the number of trees actually inspected. The correct number of phony trees found is 501--366 in commercial orchards and 135 in home orchards.

Barberry eradication for prevention of black stem rust.--With harvest practically completed in the North Central States, it is evident that losses to small-grain crops attributable to black stem rust is of little consequence, as compared with the damage to yield and quality resulting from the drought. Although stem rust became general throughout the Dakotas and Minnesota in July, the spread of the disease was greatly retarded by the lack of moisture necessary for the germination of spores and by the premature ripening of the grain. A preliminary estimate indicates that the damage from stem rust will not exceed 5 percent in any State of the spring-wheat area. The Public Works program for prevention of black stem rust is satisfactorily progressing, with a total of approximately 500 men at work in the 13 North Central States. During August approximately 70,000 barberry bushes were destroyed.

Citrus canker eradication.--Inspections for the month of July were continued in six Gulf Coast counties of Texas. This work was carried on principally in Brazoria, Galveston, and Harris Counties. Sporadic outbreaks of canker have occurred in these counties during the past few years. Some scouting was done in Chambers, Jefferson, and Matagorda Counties. During the month 41,239 citrus trees were inspected in Texas and 2 satsumas were found to be infected with citrus canker. These infections were recurrent in an old orchard northeast of League City. In Louisiana inspection work was completed in the parishes of Iberia, St. Martin, and St. Mary in July, no citrus canker being found. Work was then started in Assumption and La Fourche Parishes and one Louisiana sweet orange seedling was found infected with citrus canker in La Fourche Parish. Both it and an adjoining tree were destroyed. During August 4 trees infected with citrus canker were found in Texas, 3 in Brazoria County and 1 in Galveston County, and 1 in Louisiana, in Terrebonne Parish. All infected trees have been destroyed.

Dutch elm disease.--By September 10 the number of trees found infected with the Dutch elm disease and confirmed by the laboratory as having Graphium exceeded 7,000. Of these, 2,054 were reported from New York, 4,929 from New Jersey, and 56 from Connecticut. All the infected trees in New York and Connecticut will be destroyed by the end of October, it is believed, but with the funds as yet available from the State and Federal sources it will apparently be impossible to complete the destruction of the infected elms in New Jersey. The disease in this region has been found as far southwest as Lamington and Hillsboro, N.J., and as far northeast as Fairfield, Conn., with the center remaining near New York harbor. Early in September a tree was found infected with Graphium at Cleveland, Ohio, in the vicinity where several others were diseased in 1931 and 1932; but, in spite of this apparent carry-over, Graphium does not seem to spread in that State.

Accomplishments in blister rust control.--Blister rust control work is in progress in 31 States where the white pines are of importance, either for timber production, watershed protection, soil-erosion prevention, or recreational development, or for two or more of these purposes. This work probably reached its production peak for the season in July with the eradication of 57,019,118 Ribes plants on 682,010 acres of land. This was accomplished with 240,827 man-days of labor by approximately 19,000 men. Total accomplishments for the season up to August 31 show that 2,372,247 acres have been cleared of 169,934,568 Ribes bushes, with 737,219 man-days of labor.

White-pine areas mapped by plane.--Blister rust agents are often confronted with the problem of locating and mapping white-pine areas in remote and inaccessible regions. Hence, when Pilot Reed Brown, who is now employed as a foreman on Ribes-eradication work in Clarion County, Pa., suggested to Agent De Berti that they take a ride in his plane to see what the country looks like from the air, De Berti realized that this was his opportunity to spot-map two remote sections in Clarion and Jefferson Counties, Pa. With the aid of United States Geological Survey sheets and county road maps, the territory bounding the Clarion River and the North Fork Creek was soon mapped.

Indians stage Ribes-eradication contest.--The first Ribes-eradication contest ever held in Wisconsin between Indian reservations took place on July 23 during the Field Day celebration at Lac du Flambeau, when a picked Indian crew from the Lac Court Oreilles Reservation challenged the best crew on the Lac du Flambeau Reservation. The contest was won by the Lac du Flambeau crew by a narrow margin. Large *Ribes*-eradication programs are in progress on both reservations this year and, as they are separated by only about 100 miles, the keen rivalry which exists between the two groups centered on a controversy as to which reservation possessed the championship crew.

Pine area shows heavy blister rust infection.--An extensive pine-infection area in Becker County, in northwestern Minnesota, was recently inspected by H. N. Putnam, Milwaukee, Wis. This area was located by *Ribes*-eradication crews. The heaviest infection is quite general over about 15 acres of white pine in the 11-20-year class, averaging about 500 trees per acre. Approximately 30 percent of the pines over the entire area were infected, with nearly 100 percent infected in one part and 10 percent already dead. The oldest canker found was probably of 1923 origin. Many other cankers of 1927 origin were found and a large number of young cankers on 1932 wood were present. The crews had pulled about 150 *Ribes cynosbati* per acre in this area; therefore, as no *R. nigrum* were found, this infection appears to have been caused by *R. cynosbati*.

COTTON INSECT INVESTIGATIONS

Boll weevil resistance of cotton.--E. W. Dunnam, Stoneville, Miss., in charge of the studies on boll weevil resistance of cotton, has had some 40 varieties of cotton under observation at each of the State experiment stations at Stoneville, Raymond, Natchez, Poplarville, and State College, Miss., and at St. Joseph and Baton Rouge, La. The same varieties were thus grown this season under different conditions of soils and rainfall. Special attention has been given to determining at what age of the boll the carpel lining hardens sufficiently to prevent development of the boll weevil larvae. A simple and rapid method for field examination, sufficiently accurate for the preliminary comparative studies, has been developed. The test is simply the pulling of the carpel lining from the carpel to determine the age of the boll at which the lining can be pulled all the way across the carpel without fraying out. In some commercial varieties the carpel lining is too soft to pull at 12 days, but sufficiently tough for 50 percent to pull at 13 days and 100 percent at 14 days. In other highly selected varieties the linings may all be soft on the 15th day and all "pull" on the 16th day, whereas other varieties, especially the Sea Island crosses, were found with both soft and hard bolls over a period of 5 or 6 days. The same varieties grown under moderately dry and extremely wet weather conditions showed a variance of only 3 or 4 days in the development of the carpel lining to a similar toughness. Along with this study detailed records are being made of weevil damage in each variety under similar field conditions. Boll damage by weevils has been unusually heavy this season in many places, due to the early stoppage of square production caused by drought.

Studies of Microbracon mellitor Say.--J. W. Folsom and P. A. Glick, Tallulah, La., report: "Our biological studies of this most important parasite of the boll weevil are progressing satisfactorily. The habits of the insect are being closely observed. We now have no difficulty in keeping the parasites alive for long periods, and in obtaining mating and oviposition. Twenty-seven males and seven females of the new generation have been raised. The males emerged in from 4 to 10 days after hatching and the females in from 5 to 10 days. An abundance of material in all stages has been fixed and preserved for morphological study this winter."

Trichogramma for boll worm.--T. P. Cassidy, Tucson, Ariz., reports that the cotton growers of the Salt River Valley have purchased several million Trichogramma parasites for controlling the boll worm infestation. Reports received from farmers indicated that the damage was general, but field examinations showed that the infestation was very spotted.

Parasitism of pink bollworm low.--L. W. Noble and W. T. Hunt, Presidio, Tex., have examined the blooms collected from trap plantings of cotton in the Big Bend area for the presence of pink bollworms and their parasites. A total of 2,575 pink bollworms were found, of which 1.71 percent were dead when examined. Most of this mortality was due to causes other than parasitization, as only 3 parasites emerged from the lot. The parasites that emerged were Microbracon mellitor Say and Elasmus setosiscutellus Cwfd. Last year the parasitization by native species was considerably higher.

Insecticides for pink bollworm.--The field tests with barium and sodium fluosilicate and with derris with different diluents for pink bollworm control have been disappointing. Although all of these gave some evidence of control there has been no striking reduction in infestation with any of them and the results in the field were not as satisfactory as in the laboratory tests. This is probably due to the difficulty of obtaining good boll coverage, the poor adhesiveness under the arid conditions in the Big Bend, and the fact that about one-third of the larvae found in the bolls had entered beneath the calyx where the dust did not reach.

Cotton leaf worms in Calhoun County, Tex.--Most of the second-growth cotton in Calhoun County was destroyed by the fifth generation of leaf worms during the latter part of August. A few farmers have continued dusting for boll worm and boll weevil control and the indications are that with favorable weather they will produce a late crop of around one-third bale per acre. One thousand leaf worm pupae collected during August produced 951 adults and 31 specimens of the parasite Brachymeria ovata (Say). Four hundred eggs of Alabama argillacea Hbn. produced 81 larvae and 196 Trichogramma minutum Riley. Several plants of Arizona wild cotton (Thurberia thespesioides) planted for boll weevil host-plant studies, were considerably ragged by leaf worms.

Thiodiphenylamine only slightly effective against cotton leaf worm and the boll worm.--R. W. Moreland and A. B. Beavers report a number of tests at College Station, Tex., in which thiodiphenylamine was used at various strengths in mixtures with sulphur, lime, fuller's earth, bentonite, and derris against the cotton leaf worm and the boll worm. Thiodiphenylamine was mixed with sulphur at rates of 50 to 50, 25 to 75, and 15 to 85, and was mixed with lime in the same proportions. With fuller's earth, bentonite, and derris it was used only as a 50-50 mixture, and tests were also made with thiodiphenylamine without a diluent. None of these mixtures have been consistent in causing high mortality. The only test where the results were impressive was where the 50-50 mixture of thiodiphenylamine and derris powder caused 46.6 percent mortality of leaf worms in 25 hours and 100 percent mortality in 46 hours. In this instance it was probably the derris that killed the leaf worms. In this particular test where the other mixtures were used no worms were killed under 46 hours. In another test in which the derris mixture was not used the mixtures of thiodiphenylamine and sulphur gave better results than any of the other mixtures. After a period of 60 hours the 25 percent thiodiphenylamine 75 percent sulphur mixture had caused a mortality of 66 2/3 percent of the worms, while the 15 to 85 mixture caused a mortality of 33 1/3 percent and the 50-50 mixture killed 46 3/5 percent of the worms. In another test only two materials caused mortality of importance. After 48 hours 73 percent of the worms were killed by the 50 percent mixture of lime and thiodiphenylamine, as compared to 60 percent killed by calcium arsenate. These mixtures were less effective against the boll worm than against the leaf worm.

Thysanura and Collembola abundant in Texas soils.--In connection with studies of the relation of soil-infesting animals to the roots of cotton plants, L. D. Christenson, College Station, Tex., reports some interesting estimates of population of the black soil of the Wilson-Crockett series, 10 miles southwest of Navasota, Tex. In August a survey was completed which includes soil depths to 24 inches. The population of the soil animals, particularly the Collembola and Thysanura, is given in the following table:

Soil depth	Soil animals per acre	Animals per cubic inch of soil	Thysanura per acre	Collembola per acre
Inches	Number	Number	Number	Number
0 - 5----	48,917,000	1.56	748,000	3,119,000
5 - 8----	15,483,000	.82	2,268,000	1,686,000
8 - 12---	7,495,000	.30	408,000	1,090,000
18 - 24---	2,706,000	.07	193,301	Not found

Mr. Christenson says: "The soil depths selected as the basis for each individual census conformed to natural soil stratification. The 0-5-inch layer was exceptionally loose tilth, but fairly moist, owing to recent rains. The 5-8-inch layer constituted an exceptionally hard layer which had become so due to soil shrinkage during the extreme early summer drought. The 8-12-inch layer was also compact, but evidently had never dried to the point where marked soil shrinkage sets in and was somewhat plastic. The 18-24-inch layer was below soil horizon B and was somewhat looser in texture than the layer just above. The dominant species of Collembola was Pseudosinella violenta (Fols.), a root feeder. The dominant species of Thysanura was Evalljapyx sp., which may also prove to be a cotton root feeder. Larger soil animals in the cotton field were conspicuous by their absence."

PINK BOLLWORM AND THURBERIA WEEVIL CONTROL

Pink bollworm infestation light in Big Bend area.--The trap-plot work in the Big Bend area of Texas has been completed for the season, the last plot being discontinued on August 23. The results of this work indicate that the infestation is very light at present, only 4 of the plots showing an average infestation of over 1 percent. For all 28 plots the average percentage of infestation for the season was 1.23 and 0.15 for the adjacent field cotton. In only one section did the trap-plot records indicate a very heavy infestation, and even in this area it took very close inspection to find any worms in the adjacent field cotton. Ginning is now getting under way in this area, and we will soon be able to obtain additional information concerning the infestation by means of gin-trash inspection.

Gin-trash inspection.--Inspection of the 1934 crop began on August 1, one large machine being operated in the lower Rio Grande Valley of Texas and the other in the Matamoros area just across the river in Mexico. Later in the month two hand machines were placed in operation in Mexico, one at Nuevo Laredo and the other in the Don Martin area, a new irrigation project which was opened only a few years ago, but where considerable cotton is now grown. All of the machines were able to obtain plenty of material for inspection and the results have been negative to date. During the latter part of August laboratory inspection was discontinued and 5 large machines placed in operation. One of these machines will work in north-central Texas and the remainder in northwestern Texas. In Florida and Georgia 5 mobile and 3 hand gin-trash machines are being operated. These machines are so located that trash from a large number of gins is being inspected, including all that produced in the regulated areas. On September 3 a pink bollworm larva was found at Bascom, in Jackson County, and another larva was found on September 7. On September 4, 2 pink bollworm larvae were found at Live Oak, in Suwannee County, Fla., and an additional larva was found the following day. Suwannee County is located between the two regulated areas in Florida; however, Jackson County is a considerable distance west of the regulated areas. Gin-trash inspection is being concentrated in this section, and we expect soon to have definite information as to the degree of infestation.

Pink bollworm clean-up in southern Florida.--During the course of the clean-up of Key West, which required about 2 weeks, 9 specimens of the pink bollworm were found in green bolls on seedling and sprout plants, the branches of which reached to the edge of the road.

TRUCK CROP AND GARDEN INSECT INVESTIGATIONS

Insects cause heavy losses in stored tobacco.--W. D. Reed, A. W. Morrill, Jr., and E. M. Livingstone, of the Richmond, Va., field laboratory, report that in detailed tests to determine the amount of loss caused by the cigarette beetle and the tobacco moth in flue-cured tobacco stored in hogsheads, it was found that the loss occasioned by these two insects averaged approximately 20 percent of the weight in the samples examined. Ordinarily this damage extends to a depth of 6 inches in each hogshead. As there are more than 600,000 hogsheads of flue-cured tobacco in this country at the present time and as it is expected that at least half of these hogsheads will become infested to a depth of 6 inches or more, the annual loss to this one type of tobacco alone is estimated at approximately $8,230,000.

Chemotropic control of tomato worm moths in tobacco fields.--J. U. Gilmore, of the tobacco-insect laboratory at Clarksville, Tenn., reports that the use of poison feeders against *Phlegethontius sexta* Johan has given about the same control as for the 3 preceding years. Usually 10 or 12 tobacco fields are equipped yearly with a maximum of 10 moth feeders per acre of tobacco. These feeders are kept filled with tartar emetic as the poison and amyl salicylate as the moth attrahent for a period of 3 months, during which time the moth population is materially reduced. During the present season, 5 out of 10 fields required a light application of poison to supplement the larval control obtained by the poisoning of the tomato worm moth. During the past season all of the check fields had to be either poisoned or heavily hand-wormed to obtain a satisfactory control of the pest. These conclusions were based upon the recovery of dead moths in the vicinity of the treated fields, together with biweekly examinations of the treated and check fields to determine the abundance of tomato worm larvae.

Drought inhibits development of beet leafhopper in western Colorado and southeastern Utah.--W. A. Shands, of the Grand Junction, Colo., field laboratory, reports that owing to the lack of precipitation during July and August, the abundance of the beet leafhopper was greatly reduced. He also states that the failure of late summer and fall hosts to germinate, owing to sparse precipitation, will probably prevent the breeding of high leafhopper populations before the advent of winter. Because of low leafhopper populations at present and the probability that equally low populations of *Eutettix tenellus* Bak. will enter hibernation, the breeding areas of western Colorado and southeastern Utah will probably be of minor importance in supplying economic infestations to western-slope sugar-beet areas in 1935.

Turnips trap leafhoppers in sugar-beet fields.--Mr. Shands and O. A. Hills report that in field and laboratory tests turnips have given very good results as a trap crop for the beet leafhopper in sugar-beet fields in western Colorado. This method appears to hold excellent possibilities as an aid in the control of the beet *tenellus*.

Drought limits Mexican bean beetle injury in New Mexico.--J. R. Douglass, of the Estancia, N.Mex., laboratory, reports that economic injury to the bean fields in that area by the Mexican bean beetle has been only a very small percentage of that usually experienced. Observations during the dry season have shown conclusively that moisture is essential for egg laying and for the hatching of Mexican bean beetle eggs.

Lime treatment apparently decreases strawberry root aphid infestation.--L. B. Reed, of the Chadbourn, N.C., field laboratory, reports that in one field test the application of agricultural lime at the rate of 3,150 pounds per acre has apparently decreased greatly the amount of damage caused to strawberries by the root aphid *Aphis forbesi* Weed, as compared to check plot which did not receive any lime.

Cyclamen mite oversummers on strawberry.--Floyd F. Smith, of the Greenhouse Insects Laboratory, Washington, D.C., continuing his studies with *Tarsonemus pallidus* Banks, has found in recent tests that females of this mite were able to survive the summer on strawberry plants growing in a plot at Arlington Farm, Va.

Mite injury may be differentiated from suspected virus disease of chestnut.--Mr. Smith in his investigations of the tarsonemid mites , *T. pallidus* and *T. latus* Banks, on chestnut seedlings and hybrids, reports that as a result of recent studies he is able to differentiate between mite injury and the symptoms of a suspected virus disease of chestnuts.

Nicotine dust shows promise in controlling cabbage aphid in Ohio.--N. F. Howard and R. H. Davidson, of the Columbus, Ohio, field laboratory, report that in experiments conducted at Clyde, nicotine dust, applied during the prevalence of high temperatures and in the absence of adverse wind currents, gave excellent promise in the control of the cabbage aphid. Nicotine sulphate in combination with sulphonated petroleum oil also gave encouraging results. In these tests derris dusts and sprays did not prove as effective as the nicotine dust.

Rapid burning of fields destroys pea weevils.--A. O. Larson, of the Corvallis, Oreg., laboratory, reports that fields burned to control the pea weevil on July 24, a hot, dry day, when the straw burned rapidly, showed a survival of only 1 weevil in 97 collections in 7 fields. On the other hand, fields burned on July 25, a cloudy, humid day, when the fire failed to carry where the straw cover was thin, showed a survival of 11 weevils in 86 collections in 5 fields. In one instance, on July 27, a field was accidentally fired, an acre burning before the conflagration could be stopped. No living weevils could be found on this section of the field.

Derris and naphthalene-lime dust tested for onion thrips control.--Reporting on results of recent insecticidal tests against the onion thrips on onion, H. H. Richardson, of the Greenhouse Insects Laboratory, Washington, D.C., states: "A dilute derris-sulphonated castor oil spray (rotenone approximately

1-30,000) appeared to be about equivalent to a nicotine sulphate (1-800)-fish oil and soap spray, as judged by determinations of the number of thrips on the plants before and after spraying. A ground naphthalene-hydrated lime (40-60) dust appeared slightly less effective. Corroborating the results of other workers it was found that the Sweet Spanish variety of onion appeared more resistant to the attacks of the onion thrips than some of the other common varieties of onion."

Cold-storage treatment effective against gladiolus thrips.--R. H. Nelson, continuing tests on the value of subjecting thrips-infested gladiolus corms to low constant temperatures while in storage, reports that when corms were subjected to a temperature of 36° F. for periods of 2 and 3 months, respectively, complete kill of all stages of the insect occurred. Similarly, when corms were subjected to a temperature of 40° for 3 and 4 months, respectively, a complete kill of all stages, including the eggs, resulted. The efficacy of this practice under commercial conditions remains to be established. This confirms the results obtained in tests conducted during the storage season of 1932-33.

INSECTS AFFECTING MAN AND ANIMALS

Stable flies attack a dummy.--W. G. Bruce, of the Ames, Iowa, laboratory, reports that stable flies are readily attracted to a dummy animal. In an effort to determine whether this species is attracted to its host by sight or smell a rather crude dummy cow was constructed on a light framework of wood, padded with excelsior, and covered with burlap. Close and repeated observation shows that the flies thrust their mouthparts into the burlap. Finding no blood the fly soon leaves, often striking the leg or some other part of the dummy for another try for a meal. Twelve or more stable flies have been observed at one time on one front leg of this dummy. An attempt to catch the flies on the front legs by the use of tanglefoot was not very successful. Some 50 flies were thus caught in 2 hours, but Mr. Bruce estimates that hardly 1 fly in 50 alighting remained stuck to the adhesive. This experiment is similar to those conducted in South Africa some years ago in which R. H. T. P. Harris demonstrated that a dummy animal was attractive to the tsetse fly (Glossina pallidipes Austen).

Screw worm conference in Texas.--A conference of field men engaged in screw worm investigations was held at Menard, Tex., on August 8. E. W. Laake, E. C. Cushing, D. C. Parman, and O. G. Babcock were present. The discovery by Mr. Cushing last winter that we have two species of screw worms to deal with instead of one, as formerly supposed, made necessary an exhaustive study of the biology and habits of the two forms. These studies, so far as they have gone, indicate that the new species, Cochliomyia americana Cushing and Patton, is the aggressor in primary infestations of livestock and that Cochliomyia macellaria Fab. does not oviposit in fresh wounds but will do so in old wounds and also upon carcasses.

FOREIGN PLANT QUARANTINES

Recent entomological interceptions of interest.--A pepper fruit arriving at New York in stores from Italy was found to be infested with a living larva of the European corn borer. This insect was taken in 1927 in red pepper in cargo from Italy. A lamellicorn beetle, Macrodactylus suavis Bates, was taken at Boston in banana debris in cargo from Honduras. The beetles Minthea rugicollis Walk. and Lyctoxylon japonum Reit. were intercepted at San Francisco in orchids (Phalaenopsis sanderianum) in the mail from the Philippines. A hemipteron, Mecidea prolixa Stal, was intercepted at Washington, D.C., with grass (Hyparrhenia hirta) in the mail from Kimberley, South Africa. A living adult of the weevil Tytthomimus rufotestaceous Champ. was taken at Charleston, S.C., on banana debris in cargo from Guatemala. Living adults of the beetle Blapstinus punctulatus Sol. were taken at New York last March on excelsior packing around melons in cargo from Chile. Living adults of the hemipteron Eccritotarsus perobscurus Dist. were intercepted at Nogales, Ariz., on Neomammillaria compressa stalks in cargo from Mexico. Three living larvae of the weevil Apion malvae Fab. were intercepted at Philadelphia on dry flowers in the mail from Italy. Living specimens of Geisha distinctissima Walk. were intercepted at Seattle, Wash., on leaves of Aralia sp. and Euonymus sp. in ship's quarters from Japan. The coccid Aspidiotus transparens Green was intercepted at San Francisco on Areca sp. and on Aucuba sp. in ship's quarters from Japan. Adults of Diapus pusillimus Chapuis and Platypus australis Chapuis were intercepted at Baltimore last April in maple logs in cargo from Australia. A living adult of the lamellicorn Cyclocephala cubana Chpn. was intercepted at New Orleans on a pineapple in cargo from Cuba. The coccid Lepidosaphes (Coccomytilus) halli Green was intercepted at Washington, D.C., last March, on six apricot scions in the mail from Tripoli. The scions were heavily infested.

Recent pathological interceptions of interest.--Our first interception of Phyllosticta divergens Sacc. was made at New York on August 13 on Albizzia lebbek seed pods from the British West Indies. Phyllosticta phaseolina Sacc. was found on bean pods from Bermuda at New York. The only previous interception was from the Canal Zone in 1918. A diseased tomato from Italy was intercepted at Boston and was found to have several lesions similar to the nail-head spot caused by Macrosporium tomato Cke. in this country and Mexico. The first interceptions of the bulb nematode (Anguillulina dipsaci (Kuhn) Gerv. and V. Ben.) in this fall's importations of bulbs were made at New York in hyacinths from France and Chionodoxa sp. from Holland. Our first interception of Rhytisma sp. from England was found at New York on August 3 on maple leaves in a case supposed to contain mulberry leaves. Our first interception of the interesting fungus Pythium hydnosporum (Montague) Schröter was made at New York on August 2 in carnation leaves from Germany. Our first interception of Glomerella cingulata (Ston.) Spauld. and Schrenk on avocado was made at New York in fruit from Cuba. Our first interception of Heterosporium echinulatum (Berk.) Cke. from Norway was made at New York on August 3, the host being Dianthus sp. We have had two interceptions of this disease from England in 1921 and 1922 and one on the Graf Zeppelin from Germany in 1928.

Fruit fly finders.--The plant quarantine inspection staff in Philadelphia, with a desire to inject an additional element of human interest into their routine duties, have established an entirely unofficial but highly honorary club, the "F. F. F.", or fruit fly finders. Membership is obtained only when an inspector has made and at least partially identified a bona fide, authentic find of live fruit flies in some host coming from a foreign country. Larval, pupal, or adult stages of any trypetid will qualify an inspector for membership, provided his finding is later verified by determination at the National Museum. However, he remains a mere novice in the society until his third successful interception, upon which he becomes a full member. As the larval stages of fruit flies are difficult to distinguish, membership in this hypothetical fraternity involves more careful study than one might think, but it is well recognized that the necessary application involved in attaining membership is excellent training for the inspector.

New hosts for root knot nematode.--"A list of plants attacked by the root knot nematode (Heterodera marioni)", the most complete list of hosts (855) of this nematode, was compiled by Edna M. Buhrer, Corinne Cooper, and G. Steiner, of the Bureau of Plant Industry, and published as issue No. 7, vol. 17, of The Plant Disease Reporter, dated June 15, 1933. The list contains some hosts based on plant quarantine interceptions but only such as had been published in some form or other or that had been determined by the Bureau of Plant Industry. Additional hosts, based on interceptions made at the time of inspection of special permit material particularly, are so numerous in our files that it seems desirable to list them here in order to make the information more generally available. The following list includes additional hosts determined and indexed prior to July 1, 1934, regardless of the date of interception.

Abelia chinensis
" spathulata
Acacia sp. var. Rustica
Anemone cernua
Antennaria dioica tomentosa
Aphelandra nitens
Ardisia japonica
Asperula nitida
Berberis sargentiana
Bignonia sp. var. Madan Galen
Buddleia colvillei
Calophaca wolgarica
Cassinia leptophylla
Cephalocereus sp.
Chrysanthemum roseum

Chrysobactron hookeri
Clematis armandi
" chrysocarpa
" fargesii
" flammula rubra marginata
" indivisa lobata
" lanuginosa lawsoniana
" " durandi
" lasurstern grandiflora
" macropetala
" montana lilicina
" " superba
" " undulata
" " wilsonii
" quinquefoliata
" venosa

Clematis sp., horticultural varieties: Beauty of Worcester, Campanile, Countess de Bouchaud, Countess of Onslow, Daniel Deronda, Duchess of Sutherland, Edouard Desfosse, Fair Rosamond, Lady Betty Balfour, Lady Loundesborough, Madame Baron Veillard, Madame Grange, Miss Bateman, Modesta, Mr. Leon Beaulieu, Oiseau Bleu, Prince Hendrick, Renie Cassegrain, The Queen.

Clerodendron ugandense
Coix lachryma
Convolvulus linatus
Corylus avellana., horticultural varieties: Kent Cobb, Red Skinned, Cosford, Merveille de Bollwyller.
Cotyledon cacalioides
" coronata
" wallichi
Crassula cotyledon
Cyclamen hederaefolium
Diervilla sp., horticultural varieties: Feeay, Ideal.
Doronicum sp.
" sp., horticultural variety: Miss Mason.
Echeveria pringlei
" retusa
Echinocactus haselbergi
" mihanovichii
" quehlianus
" schumannianus
Epiphyllum sp.
Euphorbia canariensis
" clanbertina
" clandestina
" crassipes
" esculenta
" ferox
" filiflora
" gorgonis
" heptagona
" meloformis
" micracantha
" muirii
" multiceps
" nerifolia
" obesa
" pentagona
" pseudoglobosa
" pugniformis
" squarrosa
" stellata
" stellaspina
" susannae
" tridentata
" truncata
Fatsia japonica
Fuchsia excorticata
Gentiana acaulis
Geranium cinereum
Geum hybridum
Haworthia subfasciata
Hedera sp.
Helenium pumilum
Hepatica triloba fl. pl.
Hibbertia dentata
Hoya bella
Hydrangea opuloides
Iris laevigata
Jasminum stephanense
" veneris grandiflota
Lamium orvala alba
Lindera praecox
Mammillaria trichacantha
Neomammillaria sp.
Odontonema rutilans
Oenothera speciosa rosea
Paeonia albiflora
" suffruticosa
Primula pubescens, horticultural variety: Ruby.
Prostranthera rotundifolia
Raphithamnus cyanocarpus
Rehmannia africana
Rochea longifolia
Solandra guttata
Spathoglottis parsoni
Styrax dasyanthum
" veitchiorum
Veronica longifolia maritima
Viburnum carlesii

Viola sp., horticultural varieties: Belle de Chatenay, Moonlight, Reine de Blanches.

DOMESTIC PLANT QUARANTINES

Transit inspection.--Since the discovery at Chicago on July 11 and 12 of 56 live Japanese beetles arriving in cars of produce from points in New Jersey, transit inspectors in that city have carried on systematic inspection of such cars from the infested areas. Of 313 cars of produce inspected up to September 13, 97, or 31 percent, were found infested, according to a summary received from J. M. Corliss. There were 88 live and 157 dead beetles in these cars. Potato cars were 38 percent infested, bean cars 31 percent, and those containing miscellaneous produce, 24 percent. The bean cars, however, contained the largest number of beetles.

White-pine blister rust.--Permits have been issued thus far during the present fiscal year for shipping five-leafed pines from the premises of 13 commercial nurserymen located in the Northeastern States, Maryland, and Virginia, also from Forest Service nurseries at Parsons, W.Va., and Haugan, Mont., and from State forest nurseries at Charlottesville, Va., and Marietta, Ohio. The plots of two of the New England nurserymen had been tentatively approved in previous seasons for growing pines from seed and, although they are located in regions where the disease is prevalent, it was found this season that the protective zones have been successfully established, and the shipping permits were accordingly issued. A number of applicant nurseries in the Lake States, including Federal nurseries, have also carried on Ribes eradication in the surrounding zones, and the areas are now being checked to determine whether shipping permits may be issued.

Tourists carry white pines.--Thirty-seven automobiles carrying white pine trees from blister-rust infected States were intercepted during the month of August by Japanese beetle vehicular inspectors at roadside stations in Pennsylvania, Virginia, West Virginia, and Ohio. In most instances the trees were surrendered at the inspection posts for destruction. Most of the pines had been uprooted from the woods, but in two instances they were reported as nursery grown.

Black stem rust of grains.--The inspection of premises of nursery applicants for permits to ship barberry and Mahonia to the 13 grain-growing States that are being protected against the rust, is approaching completion and shipping permits have been issued to 21 growers and 1 dealer. Permittees who grow barberry and Mahonia from seed are supplied with a list of other permittees, in order that their purchases may be made from concerns that grow only the resistant species.

Phony peach disease.--Inspections for the phony peach disease had been completed up to the middle of September in nurseries approximately as follows: Alabama 4, Georgia 20, Illinois 3, Mississippi 5, Missouri 5, North Carolina 3, South Carolina 5, Tennessee 6, and Texas 40. Of principal interest in the season's work was the finding of the phony peach disease on a tree in Gasconade, Gasconade Co., Mo. This is the first known instance of the disease occurring in the central part of the State, having been limited to the extreme southeastern corner, according to previous reports. At one point in Illinois, however, where in 1932 a case of the disease from 1 to 2 years old had been discovered, no infection was found this year, either on the premises or within the mile zone.

CONTROL INVESTIGATIONS

Entomological buildings at Beltsville, Md.--The contract for the construction of three Entomological buildings on the Entomology tract, located about 2-1/2 miles east of Beltsville, Md., was awarded on August 27. These three buildings include a laboratory building, a series of four greenhouses with headhouse, and a double mushroom house. The laboratory building is 110 by 41 feet and is three stories high, including the basement. It will be constructed of brick, faced with concrete, and will have cinder block backing. The greenhouse group includes a laboratory headhouse 80 by 35 feet, constructed of brick, and three greenhouses 75 by 29 feet, the fourth being 75 by 20 feet and divided into nine small compartments with a glazed corridor along the side. The two mushroom houses, of cinder block concrete, are each 18 by 32 feet, with stucco finish, and are connected by the boiler room, which serves both houses. The buildings should be completed in June 1935.

Insecticidal value of Cracca virginiana.--F. L. Campbell and W. N. Sullivan, Takoma Park, Md., have completed a survey of the insecticidal value of 239 samples of C. virginiana root collected in 17 States by the Bureau of Plant Industry. Tests of acetone extracts of these samples against house flies showed that 17 percent of them might be considered more or less promising. The majority of effective samples came from eastern Texas. East of the Mississippi River no promising samples were found north of the 33° line. The most effective sample came from Harrison County, Tex. It is believed to contain between 3 and 4 percent of rotenone, or material of equivalent toxicity. In one test the toxicity of extracts of seeds, seed pods, and roots of plants collected in one place (Carson, Va.) was compared. The extract of the seeds was effective, whereas those of the seed pods and roots were not.

Action of derris and pyrethrum on imported cabbage worm.--M. C. Swingle and Mr. Campbell, Takoma Park, allowed the imported cabbage worm to feed on cabbage-leaf sandwiches containing dry gelatin film impregnated with derris powder or pyrethrum powder, and in other experiments let them crawl on the same impregnated films. The larvae were killed by feeding on the derris film and by crawling on the pyrethrum film, but were not affected by feeding on the pyrethrum film or by crawling on the derris film. Therefore, derris acted as a stomach poison and pyrethrum as a contact poison in these experiments.

Oxidation involved in toxicity of certain organic compounds to mosquito larvae.--As a result of his tests of synthetic organic compounds against mosquito larvae, D. E. Fink, Takoma Park, believes that organic compounds capable of being oxidized in the tissues may be toxic. Such compounds, like rotenone and phenothiazine, yield nontoxic oxidation products and therefore become ineffective if the oxidation occurs before the insect is exposed to the material, as may be the case when the material is used to protect plants against insect attack. Nitrosobenzene was added to the small number of compounds known to be more toxic than rotenone to mosquito larvae.

BEE CULTURE

Bees killed by plant poisoning.--In recent years it has been shown that both adult bees and brood suffer heavy mortalities from plant poisoning, similar to the plant poisoning of livestock. Geo. H. Vansell and others have shown that honey from California buckeye (*Aesculus californica*) causes such heavy losses of brood that many colonies are killed and the population of others seriously depleted. Mr. Vansell and W. G. Watkins have also reported cases of high mortality of adult bees caused by nectar from "spotted loco" (*Astragalus lentiginosus*) and from "corn lily" (*Veratrum californica*). C. E. Burnside and R. E. Foster reported heavy mortality of brood and bees, caused by a poisonous substance in the honey, undoubtedly of plant origin, that occurred in northern Florida in the spring of 1931. Many colonies and in some cases entire apiaries were destroyed. Beekeepers have reported that similar losses have occasionally occurred over a number of years. In the northern Florida case it was not possible to determine the source of the honey that proved poisonous to the bees. During the present season a number of cases of heavy mortality among bees and brood that showed symptoms typical of plant poisoning have been reported to the Bee Culture Laboratory, Somerset, Md. The reports have come from Texas, Georgia, Nebraska, Virginia, and New York. Some of the reports from Texas and Virginia indicate that bees in rather extensive areas have been affected. In Texas a loss of 80 percent of the colonies was reported in one instance, both adult bees and brood being killed. From samples submitted to the Bee Culture Laboratory it is not possible to make a definite diagnosis but, judging from the description submitted with the samples, it appears quite likely that plant poisoning was the cause. It is exceedingly difficult to obtain definite information on the effect of plant poisoning on bees. It is likely to occur quickly in places not readily accessible, and before arrangements can be made for detailed observations the trouble may be over.

Federal marketing agreement discussed at State beekeepers' meetings.--Warren Whitcomb, Jr., in charge of the Southern States Bee Culture Field Laboratory, Baton Rouge, La., attended the annual meetings of the Alabama State Beekeepers' Association, held at Montgomery on August 31, and the Louisiana State Beekeepers' Association, held at Baton Rouge on September 8. He reports that at both meetings much time was utilized in discussing the marketing agreement for package bees, nuclei, and queens. Changes in the agreement were proposed by both groups. In Louisiana the shippers of bees on comb would like to amend the minimum price schedule so that a 2-pound comb nucleus would sell at the same price as a 2-pound combless package. The Alabama beekeepers did not request a change in price for the coming shipping season unless the prices of other commodities, such as sugar, screen, lumber, and other materials used in the shipping of bees, should rise materially before April 1. Owing to rather heavy losses of package bees in transit during the past season, the subject drew forth a lively discussion between the bee shippers and representatives of the common carriers. Doctor Whitcomb conducted a series of experiments this spring and summer, looking toward further standardization of the shipment of package bees and queens in order to obviate heavy losses. He reports that the sale of queen bees by southern breeders has been unusually low this past season and that many of the shippers are inclined to blame this on the increase in prices that must be asked under the marketing agreement. On the other hand, he points out that because of the general condition of bees in the North, where most of the queens are sold, many beekeepers did not wish to invest in young queens because of the probability that many colonies might die before spring, primarily because of the lack of stores. The difference in the amount of business done by large and small package bee shippers and queen breeders was emphasized at the Alabama meeting. Although no complete reports are available on the volume of bees and queens sold this past year, it is quite evident that the small shippers did not fare so well as the large ones. One explanation for this is that the northern buyers are doing much more cooperative buying than they have in the past; consequently, orders are placed with the larger and more reliable firms, who are in a position to take care of large orders.

Unusual honey crop at Laramie, Wyo.--Late rains, high day temperatures, and cool nights have resulted in a very fine honey-flow at Laramie, reports A. P. Sturtevant, in charge of the Intermountain Bee Culture Field Laboratory. Prior to the end of the honey-flow from alfalfa and sweetclover, some 50 experimental colonies had produced over 6,000 pounds of honey. Twenty of the 50 colonies were only 2-pound packages on July 1. All the honey is of unusually fine quality, almost water-white in color. During the height of the flow some of the strongest colonies increased in weight as much as 25 pounds a day.

Airplane dusting kills bees.--G. H. Vansell, of the Pacific Coast Bee Culture Field Laboratory, Davis, Calif., reports that it was necessary to confine the bees to the hives from daybreak to noon during several days following airplane application of poisonous dust. One application of dust was applied without notice to the resident beekeepers, giving them no chance for protection. It is estimated that this one dusting reduced the population of adult bees 75 percent within 2 days. The loss of nurse bees from poisoning by contaminated pollen also resulted in a total absence of unsealed brood.

Demuth Memorial meetings.--C. E. Burnside, Somerset, Md., attended the Demuth Memorial beekeepers' meetings, held under the auspices of the Michigan State Beekeepers' Association, on August 1 to 4. The meetings were held in memory of George S. Demuth, who died March 2, 1934. Mr. Demuth was a member of the staff of the Bee Culture Laboratory for a number of years prior to his resignation on November 8, 1920, when he accepted the editorship of Gleanings in Bee Culture, published by the A. I. Root Company, Medina, Ohio. His contributions to bee culture, both as a scientist and as an editor, are recognized the world over. The meetings were conducted in the form of a tour, separate meetings being held at Ypsilanti, Grand Rapids, Traverse City, and Battle Creek.

INSECT IDENTIFICATION

Anacampsis laguncularíella in Cuba.--August Busck has identified specimens received from Angel R. Otero, Havana, Cuba, as Anacampsis laguncularíella Busck. This, he says, is the first record of the species from Cuba and, in fact, the first record since the description of the species in 1900 from material taken in Florida.

Rare braconid received.--Among a considerable number of Braconidae recently intercepted at Philadelphia in a shipment of casewood infested with Lyctus sp., a species of Bostrychidae, and other Coleoptera, were several specimens that have been identified by C. F. W. Muesebeck as Euscelinus sarawacus Westw., a rather remarkable and apparently rare species not previously represented in the National Museum collections.

Melanoplus differentialis in Maryland and Virginia.--Although its occurrence in Maryland and Virginia was to be expected, it is only recently that grasshoppers identified by A. N. Caudell as Melanoplus differentialis Thos. have been taken in those States. Mr. Caudell reports further that recent extensive collecting by H. A. Allard on the higher mountains of Virginia has added much material to the collection of Orthoptera in the National Museum.

European red mite from New Zealand.--Specimens identified by H. E. Ewing as the European red mite, Paratetranychus pilosus (C. and F.) were intercepted five times early this year on shipments of apples arriving at New York from New Zealand. This species has become firmly established in Eastern United States since the World War.

Collection of Membracidae comes to National Museum.--Late in August P. W. Oman brought to Washington from Livermore Falls, Maine, the collection of Membracidae of the late F. W. Goding, which was bequeathed to the National Museum. This collection, which consists chiefly of South American material, contains approximately 5,000 specimens, including numerous types.

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FRACKER AND GADDIS DESIGNATED TO HEAD DIVISIONS

On October 15 S. B. Fracker became head of the Division of Plant Disease Control and B. M. Gaddis became head of the Division of Domestic Plant Quarantines.

The Division of Plant Disease Control, which is concerned with the control and prevention of spread of white pine blister rust and black stem rust, the latter commonly spoken of as barberry eradication, has been under the direction of Dr. Fracker since the illness of the late Karl F. Kellerman.

Mr. Gaddis, who has been appointed to fill the position made vacant by Dr. Fracker's new assignment, has been a member of the Department of Agriculture under regular appointment since May 1930. The major portion of Mr. Gaddis' employment in the Department has been spent in Mexican fruit fly control. Prior to that, he was employed by the Department as an agent, being engaged in work incident to the eradication of the Mediterranean fruit fly from Florida. Early in the campaign against this pest he organized the road-traffic inspection maintained along the Georgia-Florida line and in western Florida along the Ochlockonee River. Later on he was assigned to similar work within the State of Florida where, in addition to the maintenance of road stations to enforce the quarantine on account of the Mediterranean fruit fly, he was responsible for the inspection in transit, at transfer points and at various ports in the peninsular section of Florida, of materials pertaining to that quarantine. Last March Mr. Gaddis was assigned to the Division of Cereal and Forage Insects and was given the responsibility of organizing the office maintained at Minneapolis, Minn., in connection with the campaigns for the control of grasshoppers and chinch bugs. The closing of this temporary office made him available for return to Washington. Before coming to the Department Mr. Gaddis was employed by the State of Georgia, where he was engaged in research in entomology and plant pathology and where he served as nursery inspector. In addition to the work formerly included in the Division of Domestic Plant Quarantines, Mr. Gaddis will direct the activities concerned with the eradication of citrus canker and the control of phony peach disease, two lines of work that have recently been added to that division by administrative transfer.

FRUIT INSECT INVESTIGATIONS

Further liberations of oriental fruit moth parasites.--H. W. Allen and G. J. Haeussler, Moorestown, N. J., report that total liberations for the season of adult oriental fruit moth parasites produced by and shipped from the Moorestown laboratory, including the few colonies released prior to this quarter, were 56 colonies (26,725 adults) of the native Macrocentrus ancylivorus Roh., and 161 colonies (29,839 adults) of Japanese species. Of the imported species, there were liberated 67 colonies (8,705 adults) of Bassus diversus Mues., 34 colonies (6,688 adults) of Dioctes molestae Uchida, 13 colonies (3,805 adults) of Macrocentrus thoracicus Nees., 29 colonies (8,916 adults) of Phanerotoma grapholithae Mues., 6 colonies (777 adults) of miscellaneous species, 4 colonies (656 adults) of Orgilus longiceps Mues., 2 colonies (200 adults) of Phaeogenes sp., and 1 colony (92 adults) of Calliephialtes laspeyresiae (Uchida). The total of M. ancylivorus and Japanese species released was 217 colonies of 56,564 parasites. Liberations of M. ancylivorus were made principally in Arkansas, Missouri, and Georgia by State agencies. The foreign parasites were, with few exceptions, liberated by Bureau workers, colonies being placed in Connecticut, New York, New Jersey, Pennsylvania, Maryland, Virginia, North Carolina, Ohio, Indiana, and Michigan.

Sealing protects figs from infestation and disease.--By sealing green Adriatic figs before the eyes were opened, C. K. Fisher and Perez Simmons, of the Dried-fruit Insects Laboratory, at Fresno, Calif., found that insect infestation and diseases were almost entirely prevented. In a lot of 190 figs that remained sealed for 2 to 3 months before being harvested dry, only 1.6 percent were found to be infested. Of an equal number of unsealed figs from the same tree 26.3 percent were objectionable. The sealing material, applied by hand from collapsible tubes, consisted of glucose, 59.3 percent by weight, gelatine, 6.8 percent, water, 33.9 percent, plus 0.1 percent benzoate of soda. These results represent the first success that has been obtained in experimental control of fig spoilage prior to harvest. It was found that a thick mixture of glucose, 4 percent gelatine, and water could be applied to green figs by means of a paint sprayer operating at a pressure of 50 pounds. Glucose-gelatine seals are viscous and nonpoisonous and are soluble in water.

Black pecan aphid prefers lead-arsenate-treated foliage.--Observations made by C. B. Nickels, in charge of the pecan-insect work at Brownwood, Tex., indicate that the presence of lead arsenate on the foliage favors infestation by the black pecan aphid (Melanocallis caryaefoliae Davis). Although the infestation was not severe, the trend was rather definitely indicated.

MEXICAN FRUIT FLY CONTROL

Still no Mexican fruit fly on Texas side of Rio Grande.--Trapping and fruit inspections in Texas groves during the month of September supported the results obtained in July and August, no Mexican fruit flies being observed. However, Anastrepha fraterculus Wied., A. serpentina Wied., A. pallens Coq., and two undetermined species of Anastrepha were trapped during the month in both grove and brush locations. No progress has been made in locating the native host of these species. This may be accounted for by the fact that Bumelia spiniflora, the plant most likely to be the host, has been practically barren of fruit for the past 6 months. Approximately 1,000 collections of native fruits have been placed in the pupation trays but to date have given negative results. Only four adult A. ludens were trapped in Matamoros, Mexico, during the month. However, an adult of a possibly new species was taken in one of the traps. This specimen was identical with adults reared by the Mexican inspector from mangoes originating near Vera Cruz and was very similar to the West Indian strain of fruit flies. Larvae of A. ludens, A. striata, A. fraterculus, A. serpentina, and Rhagoletis sp. were recovered from imported fruit exposed for sale on the Matamoros Market. The first shipments of the 1934-35 citrus crop left the Valley on September 27. In response to requests from the industry and in view of the fact that a considerable quantity of fruit had passed the maturity test, the shipping season was officially opened on September 26, rather than on October 1.

CEREAL AND FORAGE INSECT INVESTIGATIONS

New territory infested by European corn borer.--A. M. Vance, Arlington, Mass., reports that scouting for the European corn borer in 1934 has resulted in the establishment of new first records of infestation in the following five counties: Hamilton in Ohio, Somerset in Maryland, Sussex in Delaware, Cumberland in New Jersey, and Northampton in Virginia. This activity was conducted during the period from July 15 to September 15 by a field force of 9 scouts and 1 supervisor. It involved total travel of 51,794 miles and the examination of 2,982 cornfields, comprising some 29,585 acres in 90 counties. The territory examined lay principally along the outside border of that shown to be infested by the last survey, which was made in 1931-32. A large area was also scouted in Wisconsin, Illinois, Indiana, Kentucky, West Virginia, and Pennsylvania without additional infestations being discovered. Apparently the extreme drought in the Great Lakes States has kept the borer in abeyance there.

JAPANESE AND ASIATIC BEETLE INVESTIGATIONS

Japanese beetle larvae more abundant in summer of 1934 than in 1933.--In a seasonal series of larval surveys conducted by I. M. Hawley and H. Fox, Moorestown, N.J., diggings are made each week in sod at 8 stations in the older infested area, 4 of these stations being in New Jersey and 4 in Pennsylvania. From surveys in August it was apparent that the soil population in the older infested area as a whole was higher in 1934 than in 1933. Diggings in September continue to show a trend in this same direction. The increase in numbers in 1934 is largely in the Pennsylvania stations.

Mortality and disease in Japanese beetle soil populations in September.--There has been a gradual increase in the number of diseased larvae during the past 2 months. During the latter half of September 1933, diseased larvae made up 2.2 percent of the total soil population, as compared with 4 percent this year. Diseased grubs are now especially abundant at Tavistock, N.J., and Jenkintown, Pa.

Effect of arsenical treatment of evergreen and deciduous nursery stock in the field.--W. E. Fleming and F. E. Baker, Moorestown, report that in 1929 seedlings of various evergreen and deciduous trees and shrubs were planted equally in each of four plots of ground. One plot was left untreated, the second was treated with 1,000 pounds of acid lead arsenate per acre for control of Japanese beetle larvae, the third with 1,500 pounds per acre, and the fourth with 2,000 pounds per acre. The number of larvae per 1,000 square feet in these plots since they were established in 1929 were as follows:

Acid lead arsenate per acre	1929	1930		1931	1932		1933		1934
	Fall	Spring	Fall	Fall	Spring	Fall	Spring	Fall	Fall
	No.	No.	No.	No.	No.	No.	No.	No.	No.
None	269	120	380	715	445	1197	1,474	755	1,233
1,000 pounds	265	90	0	5	0	2	0	0	0
1,500 do	198	20	0	0	0	0	0	0	5
2,000 do	120	100	0	0	0	2	0	0	2

There has never before been any indication of injury to either the evergreen or deciduous trees and shrubs in these plots. This fall, however, some browning of the tips of the needles on some of the evergreens was noticed, which might be an indication of arsenical injury to these plants. Samples of the needles or leaves from plants grown in both untreated soil and in soil treated with 2,000 pounds of lead arsenate per acre were analyzed to determine the arsenical content. The leaves from deciduous shrubs contained very little arsenic. Rose leaves contained more than those of any other shrub, but no evidence of injury could be detected. Of the conifers, however, Pinus resinosa growing in the treated soil showed considerable injury to the tips and was found to contain 6 parts of arsenic trioxide per million, whereas none of the other varieties, with one exception, showed more than 1 part per million. The outstanding exception is the Douglas fir, the needles of which were found to contain about 59 parts of arsenic trioxide per million; but there was no indication of injury resulting from this rather high arsenical content.

Fumigation of fruits and vegetables in refrigerator cars to destroy Japanese beetles.--Tests have been conducted by J. W. Lipp, Moorestown, with hydrocyanic acid, carbon disulphide, and ethylene oxide in the fumigating house, under the conditions specified and with the quantities of chemicals recommended for fumigation of small fruits and bananas. Briefly, the results are as follows: Beets, eggplants, potatoes, onions, apples, peppers, tomatoes, carrots, and peaches were uninjured in all of the treatments. Lima beans became moldy after treatment with carbon disulphide and ethylene oxide, but were uninjured by hydrocyanic acid. String beans were also uninjured by hydrocyanic acid, but their appearance was marred by carbon disulphide and ethylene oxide. Although it is difficult to predict what might happen with the lower temperatures encountered in iced refrigerator cars, it is doubtful whether a complete kill of insects would result.

Control of the Japanese beetle in balled nursery stock.--Mr. Lipp reports that tests run with naturally infested azaleas by plunging them in soil containing paradichlorobenzene at the rate of 10 and 20 pounds per cubic yard showed a complete mortality of beetle larvae after exposure for 3 days or longer.

Preferences of Asiatic garden beetle for food plants and oviposition places.---Last spring plants to be tested were placed in the various compartments of a large cage. The middle of July 1,190 adult beetles were placed in the cage, 70 in each compartment. During the summer observations were made with a flashlight to determine the number of beetles feeding on the various plants. Chrysanthemums were entirely defoliated, feeding on peanuts was conspicuous, but little feeding was noted on the other plants. As the presence of grubs in the soil indicates the beetles' choice of places to oviposit, the soil in the compartments was dug up the middle of September to determine the population. In soil surrounding orange hawkweed, peanuts, clover, and strawberry grubs were sufficiently abundant to cause root injury as soon as they became a little older. The average numbers of grubs per square foot in these compartments were as follows: Orange hawkweed 38, peanut 34, clover 19, and strawberry, 16.

Control of Asiatic garden beetle grubs in strawberry beds.--In order to obtain additional data on a cultural method of grub control, strawberries were set out in four compartments of the cage described above. In two of these compartments the plants were mulched with 2 inches of hay during July and August and the other two compartments were left unmulched, as checks. In the mulched plants 32 grubs were found and in the unmulched strawberries there were 189. The mulching of the plants, therefore, resulted in an 83-percent reduction in the grub population. In a similar test in 1933 a 65-percent reduction in population resulted from the use of mulch. Grubs have caused caused considerable injury to strawberries on Long Island during the past few years. Some growers have used mulch as a cultural practice to conserve moisture and keep out weeds and, in view of the results given above, mulching would appear to be a wise procedure in places where the beetle population is heavy.

JAPANESE BEETLE CONTROL

Japanese beetle quarantine on fruits and vegetables lifted.--Disappearance of the adult Japanese beetle from agricultural regions producing quarantined fruits and vegetables led to the lifting, effective on and after September 16, of the seasonal restrictions on the movement of these articles. This action advanced the date prescribed by the regulations for the termination of this regulatory activity from October 15 to September 16. As cut flowers continue to be likely carriers of the adult beetle, the requirements for inspection and certification of this commodity will remain in force until October 15.

Eradication campaign in Erie, Pa., further reduces infestation.--Another progressive reduction in the number of Japanese beetles captured in Erie, Pa., was recorded as a result of this year's trapping in that city. A total of 1,427 traps was in operation from July 6 to September 8, the largest concentration of traps ever set in the city. Captures in the city in successive years have been as follows: 1931, 171; 1932, 232; 1933, 167; and 1934, 114. Of this year's total, 43 specimens were taken where infestations were discovered in 1933 and first treated in the fall of that year.

Most of the other captures represent spread not previously determined. The significant feature of the control work in Erie is that intensive trapping in the older infested section of over 44 acres, where the soil has been poisoned for a period of 2 or more years, has disclosed only 3 beetles emerging from the entire area.

Japanese beetle infestation in Maine unaffected by subzero temperatures.--Although Waterville, Maine, was included within the regulated zone in an extension of territory resulting from the spread determined in 1933, trapping was repeated there this year to learn whether the past winter's record-breaking cold weather had killed off the overwintering grubs. Instead of 204 traps being operated for 30 days, as in 1933, this year 300 traps were set for 40 days, and whereas last year 139 beetles were trapped, this year's captures increased to 299.

Soil treatments at St. Louis, Mo.--Funds were recently made available by executive order for the application of thorough control measures in all sections of St. Louis infested with the Japanese beetle. This work was begun on September 26 and will probably continue until late in October. Approximately 250 tons of lead arsenate are available for treating 117 infested blocks at the rate of 1,000 pounds per acre. This is the largest control program ever undertaken at an isolated infestation.

Gypsy moth infestation in laurel compels revision of inspection procedure.-- Presence this year of large numbers of gypsy moth egg clusters on laurel has led to a revision of the procedure by which this commodity may be certified. Quantities of laurel are annually used for roping, wreaths, and funeral pieces, particularly at the Christmas season. It was found that the egg clusters remained on the leaves or twigs despite several handlings while they were being woven into roping. Gypsy moth egg clusters have also been found on cut laurel recently submitted for inspection from southern New Hampshire, four egg clusters having been removed from the material after its shipment to Boston for reshipment to nonregulated territory. Laurel branches in large quantities or leaves and twigs that have been processed into decorative pieces cannot be satisfactorily inspected. In the future, actual inspection will be granted only for small quantities that can be carefully examined in a short time. No inspections of processed articles will be attempted. Inspection of laurel will be made on the "lot" basis. Entire uninfested sections within which it is safe to pick laurel will be designated after thorough scouting of the locality. Shippers who desire to manufacture decorative articles containing laurel for movement from the regulated zone will be obliged to confine their purchases to pickers who have obtained their material from the uninfested sections.

Gypsy moth quarantine regulations revised.--For the first time since 1931, changes have been effected in the areas infested by the gypsy moth. The revision was approved on September 27 to become effective on October 2. Freedom from infestation, as evidenced by the inspection of millions of Christmas trees over a period of years and supplemented by observations of district inspectors continuously stationed in the affected areas, made it possible to release from quarantine certain towns adjacent to the Canadian border and along the northwestern boundary of the lightly infested territory in Vermont. On the other hand, due to the increasing intensity of gypsy moth damage in other portions of the regulated area, the designation of a number of towns in Maine, New Hampshire, Vermont, and Connecticut was changed from lightly infested to heavily infested.

New England road-inspection station opened.--The stationing of a road inspector on the Mohawk Trail near Savoy, Mass., at the border of the lightly infested gypsy moth area, has resulted in the interception of numerous uncertified shipments of nursery, forest, and evergreen products. The station was established on September 12. Small lots of quarantined products are inspected and certified at the post.

European corn borer infestations noted in Virginia and on Long Island.--State nursery inspectors scouting on the Eastern Shore of Virginia during the latter part of September reported a rather wide-spread infestation of the corn borer. Practically all of Accomac and Northampton Counties were scouted and found infested. In some fields 50 percent of the stalks were infested. Scouting of the mainland area of the State failed to disclose any infestation. Inspection by a Federal inspector of Long Island dahlia fields, including large acreages in which nearly a million tubers and many thousands of young plants have been set, disclosed infestations of the corn borer in almost every field.

Differentiation of Dutch elm disease from other infections easier this fall than last.--Elms infected with Graphium, Verticillium, and Cephalosporium now show better external symptoms of the specific causal organism than was the case last year. This year foliage began to turn yellow and fall about September 20, whereas last year discoloration and fall of leaves did not begin until about October 15. Verticillium-infected trees observed late in September showed less discoloration and better size and color of foliage than did trees infected with Cephalosporium and Graphium. The observations were made on trees that first showed symptoms of the diseases early this season, making possible observations of differential defoliation caused by each disease. More efficient scouting can be done this fall, as selection of trees for sampling is much simpler in the elms that exhibit general defoliation and wilting.

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FOREST INSECT INVESTIGATIONS

Insect damage to thinned ponderosa pine stands.--L. G. Baumhofer, of the Coeur d'Alene, Idaho, field laboratory, reports that in the Black Hills of South Dakota workers from the C.C.C. camps have thinned more than 50,000 acres of young ponderosa pine to relieve overcrowded stands. The principal bark beetle breeding in the slash is Ips oregoni Eich., which normally prefers freshly cut material but when very numerous is capable of killing healthy young pine. In 1933 no Ips damage occurred but in 1934 when the beetle population was large, several instances of damage were reported. In a recent examination it was found that the killing occurred in areas isolated 2 or more miles from previous operations, where cutting had been started early in the summer. The proposal to take a million fence posts out of the Black Hills for the Great Plains Shelter Belt Project may offer a solution in regard to Ips control. All infested material removed from the stands and not peeled could be burned, thus reducing the beetle population.

New infestation of beech scale.--C. W. Collins, of the Melrose Highlands, Mass., field laboratory, reports that in September R. P. Marshall of the Division of Forest Pathology, Bureau of Plant Industry, found beech trees infested with Cryptococcus fagi Baer. in Hartford, Conn. This is the first time that the scale has been noted in Connecticut, the nearest known infestation being in Boston, Mass., and immediate vicinity. Some scouting was done in Hartford by members of the Melrose Highlands, Mass., laboratory during the last week of September, and a total of 116 infested trees were found. The infestation is apparently confined to the central portion of the city and is of several years standing.

Beech scale winter-killed in Maine.--Regarding observations made during the month in sample plots established in Maine during the fall of 1933 for observations on the beech scale, R. C. Brown, Melrose Highlands, states that the infestation has been reduced to a minimum in practically all of the plots. This is unquestionably due to the high mortality caused by the low temperatures of the past winter and by the feeding of the twice-stabbed ladybeetle. Most of the living scales found were at the bases of the trees, less than 2 feet from the ground, where they had been protected by snow last winter. Chilocorus bivulnerus Muls. was especially effective as a control agent in those areas where a heavy scale infestation and a large beetle population were present in 1933. With an abundance of beetles and a light infestation of the scale this year the infestation was very markedly reduced. Mr. Brown estimates that 90 percent control was effected on many trees, and practically complete control on some trees in southeastern Maine.

Three generations of the imported willow-leaf beetle in Massachusetts.--C. E. Hood, of the Melrose Highlands, Mass., field laboratory, has been studying the biology of Plagiodera versicolora Laich. in a screened insectary during 1934. Beetles that had hibernated were collected in the field on May 7. Consideraing the beetles that developed from eggs laid by the collected beetles as being of the first generation, there were three complete generations and a partial fourth during the year. Only a very small percentage of the females of the third generation deposited eggs.

White grubs in forest nurseries.--R. A. St. George, Asheville, N.C., reports that in the 6-week period from August 15 to October 1 white grubs have become quite injurious in the two State forest tree nurseries at Clayton, N.C., and Camden, S.C. The losses to loblolly and slash-pine beds have been considerably more serious than to those of long-leaf pine. Black locust seedlings have been attacked but, perhaps because of their more extensive root systems, have suffered much less. In order to determine the vertical distribution of the white grubs, an examination was made of 25 square feet in each of two nursery beds of loblolly pine. By removing the soil in thin layers the following distribution of the grubs was disclosed: 56 percent in the uppermost 2 inches, 30 percent in the second 2 inches, 12 percent in the third 2-inch layer, and 2 percent at depths of from 6 to 10 inches.

Pine stands thinned by girdling not endangered by insects.--Recent reports from the Ozark National Forest, where second-growth shortleaf pine stands were heavily thinned by hack girdling, state that such treatment, after a period of 1 year, has not resulted in insect attacks on crop trees to any appreciable extent. The greatest disadvantage in such a method is that trees of small diameter, 6 inches diameter-breast-height and under, are readily blown over. On one plot approximately 50 percent of the girdled small trees were blown over, whereas the trees of larger diameter rarely went down.

The balsam woolly aphid in the Northeast.--H. J. MacAloney, of the New Haven, Conn., field laboratory, has made a preliminary survey of the New England States to determine the distribution of the balsam woolly aphid, or fir bark louse (*Adelges piceae* Ratz.) which has been considered the chief cause of the wide-spread mortality of balsam fir in Maine, New Brunswick, and Nova Scotia. He has found it generally prevalent in northern New England wherever balsam fir is found in Maine, New Hampshire, and Vermont, and in several localities in Massachusetts, including the Berkshire Hills. Both the twig-infesting form and the more common form on the trunk and limbs of larger trees were common in all areas. All sizes of balsam were infested, and trees in all sites, whether in pure stands in sour sphagnum bogs or in mixed stands on well-drained soil, were equally susceptible. One report of infestation in New York has been received and scouting will be undertaken in that State.

GYPSY AND BROWN-TAIL MOTH CONTROL

Gypsy moth work in September.--In the New England area 14 infestations, totaling 1,920 egg clusters, have been discovered to September 30, inclusive. In the Pennsylvania area September scouting was concentrated in the lowlands along the Susquehanna and Lackawanna Rivers, in order that all egg clusters deposited on the lower parts of tree trunks, small brush, and debris might be located and destroyed by creosote before heavy rains, which usually occur in the fall and spring, cause the rivers to overflow their banks. It was feared that flood waters might wash infested debris downstream and that infestations might thus become established outside of the area now infested. Twenty-four infestations were found, and 3,173 egg clusters were destroyed by creosoting. Several of these infestations were located on tin cans and rubbish. These findings emphasize the importance of scouting the lowlands in the early fall while the rivers are relatively low. In the latter part of September employees of the State of New Jersey, engaged in gypsy moth work, located two egg clusters near the site of an assembling cage in Morris Township, where 12 male moths were trapped during the summer. These employees are examining tree growth on the west side of the George Washington Bridge, near Fort Lee, N.J., in an effort to determine whether or not the infestation discovered in the Bronx during the latter part of July, extends westward to that region. No infestation has been found to date. Gypsy moth work in C.C.C. and V.C.C. camps has continued during the month in 1 camp in Vermont, 10 in Massachusetts, and 7 in Connecticut. Most of the work during the summer was the patrolling of burlap bands in order to kill gypsy moth caterpillars, pupae, and female moths. It resulted in the killing of 539,034 gypsy moths in one form or another. Approximately 30,000 trees have been examined. Over 94,000 egg clusters have been treated, 72,500 being in Massachusetts, 15,800 in Connecticut, and 5,900 in Vermont.

PLANT DISEASE CONTROL

Barberry eradication, seasonal summary.--Barberry bushes in the eradication area did not rust heavily during May and the early part of June, therefore inoculum from local sources was less plentiful than usual. The first infection took place during the latter part of May and developed slowly. A second and heavier wave of infection occurred on barberries during the second week in June. However, the resulting local spreads to grain were soon overshadowed by the more general spread from south to north. During the winter of 1933-34 the uredinial stage of stem rust survived in several areas in Texas. In at least one locality (north of Dallas) inoculum increased rapidly in April, and by May 12 rust spores were found on slides exposed at Oklahoma City, Okla., and Wichita, Kans. Collections of stem rust of wheat and oats made later in these two States confirmed this date as the probable time infection took place. However, from the middle of May on through the season, the development of rust was noticeably retarded by the premature ripening of crops and by general conditions attending the drought. The first stem rust was found in Minnesota away from barberries on June 22. Its stage of development at that time indicated that the initial infection occurred about the 6th or 7th of June, when one of the few early summer rains occurred. Rust appeared in central Minnesota, South Dakota, and southern North Dakota a week later. The spread of the disease, however, was limited to localities where there had been sufficient moisture to keep crops in a succulent condition. The fact that rust could be found wherever crops in Minnesota and the Dakotas developed normally indicated that inoculum was present and that lack of spread was due in part to existing climatic conditions. In stem-rust specimens collected from Mexico to the Canadian border forms 38, 49, and 56 were found to be prevalent. These forms were noticeable in Mexico early in the spring, and the belief that a rather rapid northward movement of spores took place during May and early in June was borne out by the fact that the same forms were quite prevalent in the Northern States later in the season. Weather conditions were not favorable for the development of either the grain or the fungus, and preliminary estimates indicate that the disease caused very little damage. Recent observations indicate that the fall infection on volunteer grain and native grasses in the Midwestern States is heavier than normal.

Blister rust control work covers 752,000 acres in Northeast.--Preliminary reports indicate that during the field season of 1934 about 752,000 acres in the Northeastern States have been cleared of over 22,000,000 wild *Ribes* plants and 27,000 cultivated bushes as a result of 205,369 man-days of labor. The control work has been conducted under four major programs--regular cooperative work, P.W.A., E.C.W., and E.R.A. In connection with the E.C.W., *Ribes* eradication was performed by labor from 107 C.C.C. camps.

Ribes-eradication season closes in California and Oregon.--*Ribes*-eradication work for 1934 was brought to a close in California in September. Eradication operations on the Stanislaus National Forest came to a close on September 5, on the Plumas on September 12, and on the Eldorado on September 18. On these three forests, 18,196,122 *Ribes* bushes were eradicated during the season and over 190,400 acres were covered. The *Ribes*-eradication season in Oregon was terminated on September 21. A total of 24,703 acres of white pine and sugar pine had been treated and 2,574,289 *Ribes* plants had been eradicated.

September weather aids blister-rust infection.--The spread of blister rust from *Ribes* bushes to white pines in unprotected areas in the Northeastern States was favored from June to September by prolonged periods of cool, moist weather. In September, conditions were especially favorable for the spread of the disease in many parts of this region. According to the Boston Weather Bureau, September was the darkest month in its history, there being only 118 hours of sunlight out of a possible 350. Rain fell on 15 days of the 30. The total rainfall for the month was 5.67 inches, and the temperature averaged 64.6° F. The pine infection that originated in 1934 will not become fully apparent, however, until 1937, as the disease requires a 3-year incubation period on pine before the blister stage is developed.

Blister rust infection becoming well established on pines in New Jersey.--Prior to 1934, blister rust had not been reported on native white pine in New Jersey and very little *Ribes*-eradication work had been performed, except in the environs of the State nursery. However, recent scouting by two Federal agents in the northwestern part of the State revealed well-established pine infections in three townships. In Montague, 20 infected pines were located, most of the cankers being of recent origin. Five additional diseased pines were discovered in Vernon, one of them being a 24-year-old tree that had been killed by the rust. In West Milford, heavy infection was found to extend throughout an area comprising 15 acres of pine, ranging in age from 5 to 30 years. At least 20 percent of the pines in this tract are diseased with cankers whose origin dates from 1925 to 1932. In certain parts of the area over 50 percent of the pines are infected. The source of this infection was a patch of cultivated *Ribes nigrum* (destroyed several years ago) and *R. rotundifolium* growing in abundance throughout the area. Spot pine infections of recent origin were also located in four other blocks in West Milford. Last summer 2,712 acres of pine in the townships of Montague, Sandyston, and Wallpack were protected from additional blister-rust infection by the eradication of 22,626 wild *Ribes* bushes and 859 cultivated ones.

New blister rust infections.--R. A. Sheals and State leader O. J. Dowd recently found blister rust in Ashtabula County, Ohio, on *Ribes nigrum* bushes. No infection on white pine was located. Mr. Dowd reports that during September 73,202 *Ribes* bushes on 4,935 acres were eradicated in the State. In Iowa blister rust was found this summer both on white pine and on *Ribes* in the

Pine Hollow area in Dubuque County. Fifteen *R. cynosbati* bushes were found spotted with infection, and one white pine with three cankers was found, the infection being 3 or 4 years old. On September 2, two blister rust scouts in Maryland found blister rust infection on gooseberries in Allegheny County. There were probably 100 bushes scattered over about 3 acres and each bush was heavily infected, in some instances the infection amounting to 90 percent of the leaves. With the exception of infection found on black currant at Frostburg in 1931, this is the first blister rust infection in this county. Infection was also found recently near Norbeck in Montgomery County on European black currant bushes.

COTTON INSECT INVESTIGATIONS

Unusual insects on cotton this season.--According to F. F. Bondy and C. F. Rainwater, Florence, S.C., the cowpea aphid (*Aphis medicaginis* Koch) has caused considerable injury to young cotton throughout the Pee Dee section of South Carolina. This species has been more abundant on cotton at Florence this summer than has *Aphis gossypii* Glov. Mr. Rainwater found the leaf hoppers *Empoasca fabae* Harr. and *Alconeura unipuncta* Gill. very abundant in sweepings at Florence from June to September, and J. A. Watts found them very abundant at Clemson College. Feeding scars presumably caused by these species were noticeable in many fields. *Anomis flava fimbriago* Steph. and *Anomis* sp. (*erosa* Hbn.?) caused some injury to squares at Florence. The salt marsh caterpillar (*Estigmene acraea* Drury), at times a locally important cotton pest in Texas and Arizona, caused some injury to leaves at Florence. Cutworms (*Feltia* sp.) caused much local damage in some fields at Florence by cutting off the young cotton plants just under the surface of the ground.

Survey of boll weevil parasites.--Extensive collections of infested cotton squares were made by employees and State collaborators in the South Atlantic States and on a smaller scale in the cotton sections west of the Mississippi River and the northern part of the Belt. P. M. Gilmer, Tallulah, La., reports that, although all tabulations and identifications are not complete, the parasitization was found to be very low again this year. From 103,592 squares caged, an average parasitization of 1.80 percent was obtained. The highest parasitization in any lot of squares was 18.27 percent, and only 8 percent of the lots showed more than 10 percent parasitization. *Microbracon mellitor* Say was by far the most abundant of the dozen or so species taken, constituting approximately 80 percent of the total number of parasites.

Parasites of pink bollworm.--A. J. Chapman, L. W. Noble, and W. T. Hunt, of the Presidio, Tex., laboratory, report that no recoveries have been made to date in the fields of the Big Bend district where the pink bollworm parasites *Exeristes roborator* Fab. and *Microbracon mellitor* were liberated last season. Breeding work has been continued and, at the request of the Mexican Department of Agriculture, 5,000 spin-ups of *E. roborator* were shipped to the Laguna district of Mexico during the latter part of July and 6,000 *Microbracon brevicornis* Wesm. to Camargo, Chihuahua, for colonization. *E. roborator* has since been recovered in the fields where it was liberated this season. The Mexican Department of Agriculture and the cotton planters of the Laguna district have contributed the money for the construction of a parasite-rearing laboratory at Torreon, Coahuila. This work will be under the supervision of the Mexican Department of Agriculture, and Sr. Juan Montúfar has been detailed to visit Presidio to acquaint himself with the methods used in breeding the parasites.

Flea hopper a serious cotton pest.--K. P. Ewing and R. L. McGarr, Port Lavaca, Tex., report that the average production of cotton in Calhoun County will be around 175 pounds per acre, the lowest in many years if not the lowest on record. This extremely low yield was due to early damage by flea hoppers, to the hurricane on July 25, to the heavy infestation of leaf worms during the latter part of July and August, and to boll weevil injury to late cotton.

Flea hopper control tests.--Fifty-four 1-acre plats were dusted this season. The three principal insecticides tested were (1) sulphur (200-mesh), (2) a mixture of 75 percent calcium arsenate and 25 percent wet-mixed paris green, and (3) sodium fluosilicate. Other insecticides tested were calcium arsenate, a mixture of molasses and calcium arsenate, and different proportions of sulphur with wet-mixed calcium arsenate and paris green. A count of damaged bolls showed that, although the average percentage of loss was about the same in the treated and untreated plats, the estimated loss in pounds of cotton per acre was 84.2 in the checks, 290.8 in the sulphur plats, 272.9 in the plats treated with the calcium arsenate-paris green mixture, and 108.3 in the sodium-fluosilicate plats.

Insects and cotton-disease transmission.--L. D. Christenson, College Station, Tex., reports: "The contention that insects are disseminators of cotton wilt disease is supported by results of cultures of insects collected in badly wilted cotton. It has been found that a rather high percentage of the orthopteron fauna (principally Locustidae) are natural carriers of viable spores of *Fusarium vasinfectum*. * * * In a field of badly wilted cotton at Beaumont, Tex., 33.3 percent of the grasshoppers examined carried the fungus internally. In a field located 2 miles south of College Station, Tex., 12.8 percent of the grasshoppers present on July 30, 1934, contained *Fusarium vasinfectum*. By September 14 the occurrence of the wilt organism in grasshoppers in the same field had increased to 23.7 percent. Species of grasshoppers in the field in which the fungus in question has been found in a viable state, as evidenced by positive results of cultures made, may be listed as follows: *Melanoplus mexicanus* Sauss., *Melanoplus differentialis* Thos., *Schistocerca americana* Drury, *Schistocerca obscura* Fab., *Encoptolophus texensis* Brun., *Spharagemon cristatum* Scudd., *Tomonotus aztecus* Sauss., *Chortophaga viridifasciata* De G., *Dissosteira carolina* L., *Trimerotropis citrina* Scudd., and miscellaneous grasshopper nymphs."

PINK BOLLWORM AND THURBERIA WEEVIL CONTROL

More on gin-trash inspection.--The finding of new infestations at Bascom, in Jackson County, and at Live Oak, in Suwannee County, Fla., by gin-trash inspection, was mentioned in the last number of the Bureau's News Letter. Since then intensive inspections have been made in these counties and also in nearby counties in Florida, Alabama, and Georgia. Since the original findings, 5 additional specimens have been taken in Suwannee County and 6 in Jackson County.

On September 26 a specimen was found at Cottondale, in Jackson County. Both of these counties were added to the regulated area on September 19. On September 20 a pink bollworm was found at Greenville, in Madison County, which was already under regulation, 1 specimen having been found at a gin at Madison last year. On October 2 a specimen was found in trash at Williston, in Levy County, just south of the older regulated area. On October 4 a specimen was found at Live Oak in cotton grown in Hamilton County, the trash having been caught separately by the ginner. It was possible to locate the field in which this cotton was produced, and some field inspections have been made but no additional specimens found to date. Gin-trash inspection in Alabama and Georgia has given negative results. Some field inspection has also been carried on in southeastern Alabama by State employees, also with negative results. In Texas gin-trash inspection is being carried on in the regulated area of the Western Extension and in a number of counties just outside. The supply of trash has been plentiful. Inspections in Mexico have been completed. They were carried on in the Don Martin Project, at Nuevo Laredo, the San Carlos Project, across the river from Del Rio, Tex., and at Piedras Negras, opposite Eagle Pass, Tex. Gin-trash inspection is also now under way in the Thurberia weevil area in Pima County, Ariz., and in the Salt River Valley of Arizona, which was released from the regulated area last December. Results have been negative in all of the above inspections. In the Big Bend area of Texas several State employees have been making gin-trash inspections when not engaged in other duties. To date these men have inspected trash from some 58 bales of cotton. From the extreme lower end of the Presidio ginning territory 145 worms per bale were found, 132 in the section just below Presidio, 390 in the section just above Presidio, and 183 in the upper end. These findings indicate that the infestation is much lighter than last season, as was also indicated by the trap-plot results.

Inspection station reopened.--The road station just south of Marfa, Tex., was reopened September 1. This station guards the main roads leading from the Big Bend area, and is being operated on a 24-hour basis, two inspectors being furnished by the State Department of Agriculture and two by this project. During September 15 cars were found carrying contraband material, none of which was infested by the pink bollworm.

TRUCK CROP AND GARDEN INSECT INVESTIGATIONS

Russian thistle control in California.--F. R. Lawson, of the Modesto, Calif., field laboratory, reports that results of the program conducted in 1933 by the C.W.A. in Stanislaus County, Calif., for Russian thistle control, indicate great reduction in the acreage of this favored wild host of the beet leafhopper. The actual reduction in leafhopper population in this area is 53.2 percent over that of 1933. However, in Merced County and in the uncontrolled portion of Stanislaus County, leafhopper populations have increased 64.9 percent over those of 1933.

Mole cricket in strawberries and truck crops in North Carolina.--W. A. Thomas, of the Chadbourn, N.C., field laboratory, reports that the mole cricket (Scapteriscus vicinus Latr.) has been particularly abundant in strawberry fields and in areas of fall-grown truck crops in North Carolina. Many growers are using the standard poisoned bait in strawberry fields to check the activities of this insect.

Wild gourd plant attracts cucumber beetles.--R. E. Campbell, of the Alhambra, Calif., laboratory, reports excellent results in attracting three species of cucumber beetles by utilizing the vegetative portion (macerated) of a wild gourd plant, *Cucurbita foetidissima* Hbk., as an attrahent. During a 24-hour period of exposure in a squash field, approximately 2,300 beetles were attracted to 32 baits composed of this plant. The species concerned were *Diabrotica soror* Lec., *D. trivittata* Mann., and *D. balteata* Lec.

Five species of Diptera reared from tomatoes in Maryland.--R. H. Nelson, of the Greenhouse Insects Laboratory, Arlington Farms, Rosslyn, Va., continuing studies on maggots often found in canned tomatoes, reports that he has recently reared five dipterous species from tomatoes collected in commercial plantings and canneries in Maryland. *Drosophila melanogaster* Meig. is by far the most common.

Dusting gives good control of tomato hornworm.--L. W. Brannon, of the Norfolk, Va., laboratory, reports that 12 different insecticidal dusts were tested against tomato hornworms (*Phlegethontius sexta* Johan.). Under cage conditions calcium arsenate, cryolite, barium fluosilicate, and a derris dust containing 0.5 percent rotenone mixed with talc, were toxic to the full-grown worms.

Weather believed a factor in control of tobacco hornworms by poison feeders.--F. S. Chamberlin, of the Quincy, Fla., laboratory, reports that eight feeders per acre were placed in two fields of shade-grown tobacco containing 13 and 14 acres, respectively, for the control of the tobacco hornworms. Low temperatures and rainy weather prevailed in the early part of the season and the feeders gave little apparent protection. As the season progressed, the protection afforded by the feeders became more pronounced. The apparent reduction in hornworm infestation for the season was 50 percent, as compared with 83 percent for 1932 and 62 percent for 1933. This decrease may be attributed either to the cool, rainy season or to the decreased number of feeders used per acre.

Poisoned baits control tobacco budworm.--According to a report submitted by Mr. Chamberlin, excellent control of the tobacco budworm was obtained during 1934 in the Quincy area by the use of a poisoned bait consisting of 1 part of lead arsenate and 75 parts of corn meal, by weight. Comparative tests demonstrated that derris could not be substituted for the arsenical in this treatment.

Effectiveness of derris-sulphur dust against melon and pickle worms.--M. M. High, of the Biloxi, Miss., field laboratory, reports that in tests made early in the season against the melon worm and the pickle worm on summer crookneck squash, 7 applications at weekly intervals of a mixture of derris, sulphur, and clay dust (1-2-1 parts by weight), containing approximately 1.5 percent rotenone, resulted in a reduction of 60 percent in infested fruits, as compared with untreated plants. The first 5 treatments were applied at rates of 12 to 15 pounds per acre per application and the last two applications at rates of 20 to 40 pounds per acre per application. Similar tests indicated a reduction of 57 percent in infested cantaloup fruits in treated plots, as compared with fruits in untreated plots. The dusting mixture burned the leaves of young cantaloups severely and in general was not as effective on these plants as on summer squash. W. J. Reid, of the Charleston, S.C., field laboratory, reports that in experiments with these two pests under South Carolina conditions, a dust mixture consisting of derris root powder containing 1 percent rotenone, with sulphur and pulverized clay as diluents, reduced a heavy infestation of melon and pickle worms on squash approximately 88 percent, while on cucumbers and cantaloups control of approximately 86 percent was obtained. Four applications were made at an average rate of 16 pounds of the dust mixture per acre. Dust mixtures containing 0.5 percent rotenone showed considerable toxicity to the insects but were not as effective as the 1 percent mixture. A dust mixture composed of 50 percent calcium arsenate, with sulphur and clay as diluents, proved slightly inferior in toxicity to either the 1.0 percent or the 0.5 percent rotenone dust.

Insecticides effective against lima bean pod borer.--Rodney Cecil, of the Ventura, Calif., field laboratory, reports that barium fluosilicate, cryolite (natural or synthetic), or potassium hexafluoaluminate, applied at a concentration of 80 percent, gave control ranging from 67 to 94 percent, as compared with the untreated check plots. These tests were conducted under practical field conditions and indicate a possible control for this pest.

Efficiency of derris dust mixtures against pea weevil.--The results of an extensive series of laboratory tests by T. A. Brindley, of the Moscow, Idaho, field laboratory, demonstrate that derris-dust mixtures containing 1.0 percent rotenone or pyrethrum-dust mixtures containing 0.9 percent total pyrethrins, applied at the rate of 20 pounds per acre, with diatomaceous earth as a diluent, killed a satisfactorily high percentage of pea weevil adults.

Curly-top damage curtails sugar beet production in Colorado and Idaho.--W. A. Shands, of the Grand Junction, Colo., field laboratory, reports that curly-top disease caused by the beet leafhopper in the two main beet areas on the western slope of Colorado continued to increase during the summer until by the end of September practically 100 percent of the plants were infected. Although most of the acreage in this area is planted to so-called "resistant" sugar beets, it is anticipated that the tonnage yield on the western slope will be considerably less than in 1933. J. C. Chamberlin, Twin Falls, Idaho, reports that current estimates (August 25) received from the Amalgamated Sugar Company indicate that the total yield of sugar beets for the Twin Falls and Burley areas in Idaho will not exceed 12,000 to 20,000 tons, as compared with a yield of 351,000 tons for the same areas in 1933. Curly-top disease has probably been the most influential factor in causing this reduction, but the shortage of irrigation water as a result of the general drought has been a contributing factor.

Pea moth causes severe damage in Washington State.--According to a report submitted by C. F. Doucette, of the Sumner, Wash., field laboratory, the pea moth is causing heavy losses to pea growers in Whatcom and Skagit Counties, Wash. In a conference with Arthur Hanson, entomologist at the Western Washington Experiment Station, Puyallup, Wash., Mr. Doucette learned that some plantings of peas in the above-mentioned counties have been so heavily infested that it was very difficult to find a single pod free from infestation.

Life history of lily thrips in Northwest.--Ralph Schopp, Sumner, reports that an increase in the population of adults and a decrease in that of the earlier instars, particularly in the first instar, from the middle of August to the end of September, indicates that egg laying had almost stopped. Adults dispersing at the same period suggest a possible relationship. Apparently there have been two broods thus far this season.

Derris dust effective against harlequin bug on turnips.--J. U. Gilmore, of the Clarksville, Tenn., field laboratory, reports that in preliminary tests, dust mixtures containing 3.2 percent rotenone with tobacco dust as a diluent, applied at the rate of 15 pounds per acre, resulted in a mortality of 75 percent of adult harlequin bugs on turnips within a period of 24 hours.

Hot-water treatment controls iris thrips.--F. F. Smith, of the Greenhouse Insects Laboratory, Washington, D.C., continuing his studies on the iris thrips (*Bregmatothrips iridis* Watson) on Japanese iris found that on plants immersed for 30 minutes in water at 110° F. at the Brooklyn Botanic Gardens all thrips had been killed.

Spraying for control of red spider and thrips on cucumbers in greenhouses.--C. A. Weigel and H. H. Richardson, of the Greenhouse Insects Laboratory, Washington, D.C., report that in a practical test with a power sprayer, using derris 1-2,500 and sulphonated castor oil, 1-400, the spray was mixed in the 200-gallon power sprayer and applied at 400 pounds pressure with a 3-nozzle disk sprayer on a rod. The application was made as thoroughly as practically possible, with a total of about 35 gallons to 200 cucumber plants that were from 7 to 9 feet high and that had very dense foliage. The spray gave 95 percent control for the red spider mite and 96 percent control for the thrips. The addition of pyrethrum extract (1-444 and 1-660, which is equal to pyrethrum 1-20,000 and 1-33,000, respectively) to the spray, appeared to add little to effectiveness against the red spider but it did add slightly to effectiveness against the thrips.

Tuberoses tolerant to hot-water and vapor-heat treatments.--Reporting on the effectiveness of hot-water and vapor-heat treatments against the bulb mite in tuberoses, Mr. Weigel and R. H. Nelson state that in the tolerance phase of this work it was found that on the whole stands ranging from 95 to 100 percent of the tuberoses were obtained following the various treatments given. In most of the treatments the results are equal to those of the checks and apparently the bulbs are not affected adversely by any of the treatments.

Kerosene emulsion continues effective against Mexican mealybug.--Mr. Richardson, in further tests with a 10 percent kerosene emulsion at 100, 200, and 300 pounds pressure, gave very high mortality of the active stages of the Mexican mealybug (*Phenacoccus gossypii* T. & Ckll.). This control measure is particularly useful in pompon chrysanthemums grown in beds out of doors under cloth shelter. No injury to the plants is apparent. The chrysanthemum aphid, usually present at this time of the year, is also killed by this treatment.

Recoveries of Mexican bean beetle parasite.--N. F. Howard and B. J. Landis, of the Columbus, Ohio, field laboratory, report that during the season of 1934 approximately 6,300 adults and puparia of the imported tachinid parasite *Paradexodes epilachnae* Ald. were bred and liberated at various points in Alabama, Virginia, and Ohio. During the rearing operations a total of approximately 13,000 parasite puparia were obtained and 7,200 adults emerged. Recovery collections made at Birmingham, Ala., and at South Point, Ohio, demonstrated that the parasite had become established. Collections made at Chattanooga, Tenn., Newark, Del., and Athens, Ohio, where liberations were made in 1933 but not in 1934, indicated that the parasite had not survived in these localities.

INSECTS AFFECTING MAN AND ANIMALS

Screw worm situation in Southeastern States.--Serious and wide-spread screw worm infestations are now prevalent in Georgia, Florida, Alabama, Mississippi, and Louisiana, and numerous calls for aid in controlling the situation have been received. In several localities stockmen reported infestations as high as 50 percent of the sheep and 25 percent of the cattle. The farmers and stockmen of these States, unlike the ranchmen in western Texas, have had little or no previous experience with this pest and were totally unprepared for it when it struck. Preliminary to mapping out control campaigns a survey of the extent of infestation in each State was made by Bureau men. While this work was under way tentative arrangements were made with the F.E.R.A., whereby a portion of the funds allotted by that organization to the affected States might be used for screw worm control. These arrangements have been perfected in Georgia, Florida, Alabama, and Mississippi, and control campaigns are now under way in those States. With the exception of Alabama, where the work is being directed by the State Veterinarian, the leadership and direction rests with Bureau representatives. In Georgia W. E. Dove and R. A. Roberts are directing a force of 26 supervisors; in Florida W. V. King and G. H. Bradley are directing 29; and in Mississippi D. C. Parman and O. G. Babock have a force of 18.

Breeding places of the stable fly.--W. V. King reports that after a 2-weeks search for breeding places of *Stomoxys calcitrans* L. in the vicinity of Panama City, Fla., during September, larvae were finally obtained in moist collections of two species of brown algae of the genus *Sargassum*. This type of algae appears to develop only in the open Gulf and is found only along the Gulf beach and near the inlets. It was locally reported as appearing annually in the sea water during June, July, and August, with the subsequent formation of drifts along the beach. Apparently the breeding of the flies in this material might offer an explanation for the extremely heavy outbreaks that occur nearly every year during September and October along this particular stretch of coast.

Tests with stained mosquitoes.--In a series of tests for the purpose of gathering data on longevity and flight range of western species of Aedes, H. H. Stage, Portland, Oreg., and his assistants have captured by various methods a total of 16,914 adult mosquitoes during this season. Of these only 15 proved positive for traces of stain. No adult was recovered during the season at a greater distance than 1 mile from the point of staining, and the longest span of life recorded was 39 days after staining. Recoveries were made at points both with and against the general wind currents, and across the Columbia and Willamette Rivers in both directions. In the three seasons during which these staining tests have been conducted a total of 27,813 adults have been captured. Of these 43 have shown traces of stain. The greatest distance covered by an adult so marked was 4-3/4 miles air line and across both the Willamette and Columbia Rivers, but in the direction of the prevailing wind. The longest span of life recorded by a stained specimen is 52 days and the fastest rate of travel noted was a half mile within 4 days.

Diking for control of sand fly and mosquito breeding.--At Fort Pierce, Fla., a diking experiment for control of sand fly and mosquito breeding in a mangrove marsh is most promising. The small rise and fall of the tides are not sufficient to permit drainage of such marshes. It is necessary to drain to a pit and then to remove the water from the pit by pumping. During the recent high tides there was no evidence of seepages and the dike was adequate for the protection of the marsh.

Benefits from C.W.A. mosquito control.--Gratifying reports concerning the effect of the mosquito control operations conducted in cooperation with the C.W.A. last winter in various parts of the country continue to come in. Thus, at Sandlake, Oreg., where a salt marsh area of 1,500 acres was drained by connecting numerous pot holes with the main channels, we are told that mosquitoes have been reduced from literally myriads to occasional specimens. A similar report is made concerning the effect of ditching on Bainbridge Island, Wash. At Savannah, Ga., the mosquito emergence was not sufficient to annoy residents during the past summer until about 2 months after the usual time for them to become annoying. The reduction was noticeable to all and some of the most skeptical have been convinced of the value of last winter's drainage operations.

Mosquito control in New Jersey, Delaware, and Maryland.--On September 25, F. C. Bishopp addressed the Rotary Club of Atlantic City, N.J., on the subject of mosquito control, after which some of the ditching operations in New Jersey, Delaware, and Maryland were inspected. Little progress in mosquito-control work in southern New Jersey is being made because of lack of funds. This is also true in Maryland, although in the vicinity of Ocean City there is an active interest in having the work continued. The work in Delaware, under the direction of W. E. Corkran, is being carried forward with vigor by the two C.C.C. camps assigned to that work last fall. A marked reduction in mosquito abundance has been manifest this season in the vicinity of Rehoboth, Lewes, and other coastal towns of southern Delaware, where this work is under way.

FOREIGN PARASITE INTRODUCTION

Pink bollworm parasites from Egypt.--Two shipments of *Microbracon kirkpatricki* Wilk. have recently been received from Cairo, Egypt. This species attains a high percentage of parasitization in Kenya and Tanganyka colonies and was introduced into Egypt a few years ago. Through the courtesy of the Egyptian entomologists, H. L. Parker was provided with sufficient stock for rearing purposes. Shipments were made of both adults and immature stages and these arrived at the bollworm laboratory at Presidio, Tex., in excellent condition.

Egg parasites of elm leaf beetle.--The shipment of *Galerucella* eggs from R. W. Burrell, of the Yokohama, Japan, laboratory, to H. S. Smith, Berkeley, Calif., forwarded in June, yielded a 16 percent emergence of *Tetrastichus* sp., with no hatch of unparasitized eggs. All eggs were kept in cool storage at approximately 50° F. for 2 to 4 weeks before shipment and were also held in cool storage en route. These conditions produced 100 percent mortality among unparasitized eggs, but were not detrimental to the immature stages of the parasite.

Importation of Tiphia sp. No. 29 for parasitization of Japanese beetle.--On September 10 there was received at the Moorestown, N.J., laboratory a shipment of 6,060 laboratory-reared cocoons of *Tiphia* sp. No. 29, which was examined by L. B. Parker. This material was reared by R. W. Burrell at the Yokohama laboratory from sericinid larvae parasitized by this *Tiphia*. Of a total of 11,167 ovipositions, 6,388 cocoons formed, representing 57 percent. Of these, 6,060, or 54 percent, were in good condition and were shipped to the United States on August 25. The cocoon formation is considered quite satisfactory, especially since the last 2,000 ovipositions were on host larvae that were in a very advanced state at the time of parasitization. Upon arrival at Moorestown, the shipment was broken down and the cocoons placed in the usual individual glass vial set-up for overwintering in the temperature-controlled cellars. Of the cocoons making up the shipment, 5,904, or 97.4 percent, appeared to be in excellent condition.

FOREIGN PLANT QUARANTINES

Recent entomological interceptions of interest.--Seven living larvae of the Mediterranean fruit fly were intercepted at San Francisco in a mango fruit in crew's quarters from Hawaii. An adult of *Ataenius picinus* Har. was intercepted at New York last April on packing for grapes in cargo from Argentina. Living specimens of *Galgupha punctifer* Mc. & M. were taken at Charleston, S.C., on banana debris in cargo from British Honduras and Honduras. Living specimens of *Rhodites rosae* L. were intercepted at Los Angeles, Calif., in galls on dead rose cuttings in the mail from Italy. The thrips *Frankliniella ameliae* Hood was found last May at Nogales, Ariz., on tomatoes in cargo from Mexico. J. R. Watson reports that this species is found in the Southwest, including Texas and New Mexico. Thirty larvae, 18 pupae, and 53 adults, all living, of the West Indian sweetpotato weevil (*Euscepes batatae* Waterh.) were intercepted last June at New Orleans in sweetpotatoes in stores from Brazil.

A living specimen of *Jadera rubrofusca* Barb. was collected on seagrape (*Coccoloba uvifera*) in the field at Dorado, P.R. A living adult of *Metriona propinqua* (Boh.) was taken at Mobile, Ala., on a banana in cargo from Honduras. *Lepidosaphes camelliae* Hoke was intercepted at San Francisco on *Camellia* sp. in ship's quarters from Japan. A living specimen of *Orthotylus ericetorum* Fall. was found at Philadelphia on a heather flower in the mail from England. The European corn borer was intercepted at Seattle, Wash., in ears of green corn in ship's stores from Japan. Both living and dead borers were found. A living mango weevil was found at San Pedro, Calif., in a mango seed in baggage from Hawaii. Larvae and pupae of the lesser bulb fly were intercepted at Washington, D.C., in a narcissus bulb in the mail from England. Living adults of *Hylesinus fraxini* Panz. were taken at Philadelphia in ash sapwood for crating chinaware in cargo from England.

Recent pathological interceptions of interest.--*Botrytis galanthina* (B. and Br.) Sudw. has been intercepted on *Galanthus* sp. bulbs an unusual number of times this fall. *Anguillulina dipsaci* (Kuhn) Gerv. and v. Ben. has been intercepted in *Chionodoxa* sp. from Holland at New York and Philadelphia, in *Muscari* sp. and *Scilla* sp. from Holland at New York, in *Hyacinthus* sp. from Holland at Detroit, and in garlic from Italy at Philadelphia. *Botrytis tulipae* (Lib.) E. F. Hopkins sclerotia were found on tulip bulbs from Holland at New York and Philadelphia. Sclerotia and conidia of *Penicillium gladioli* Machacek were found on gladiolus corms from Mexico at Nogales on September 8, our first interception of this disease from Mexico. *Phomatospora* sp. was found on leaves of *Euonymous* sp. from Japan at Seattle on August 30. The only previous interception of a member of this genus was on *Fatsia japonica* from Japan. Our first interception of *Septoria castaneae* Lev. was made at Philadelphia on August 27, on chestnut leaves from Italy. Our first interception of *Ramularia destructiva* Plowr. and Phil. was made at Baltimore on September 5, the host being *Myrica gale* from Scotland. A second interception of *Ustilaginoidea virens* (Cke.) Tak. in rice from the Philippine Islands (see Bureau Plant Quarantine News Letter, June 30, 1934, p. 3) has been made, this time at Philadelphia.

Fined for smuggling fruit.--A resident of Weslaco, Tex., was apprehended at Hidalgo as he attempted to smuggle 3 mangoes, 2 quinces, and 4 pomegranates from Mexico concealed under the seats of his automobile. A fine of $5 was assessed for the offense. Seven larvae, taken from one of the mangoes before the seized fruit was destroyed, have been identified at the National Museum as belonging to the genus *Anastrepha*.

Vegetable dye aids in identification of plant products.--Recently there arrived from abroad a shipment of dried plant material which was apparently unrecognizable. However, the idea of testing the fragments with alcohol occurred to someone. The solution was immediately colored by the diffusion of a soluble pigment, and the material readily gave up its identity. The pigment is a harmless vegetable dye, the product of a tropical plant long known and used for its easily extracted coloring properties, and has been frequently employed to impart a rich hue to wines.

Insect attacks packing cases.--Reversing the usual order of things, a shipment of 121 cases of cashew nuts from India entering New York on August 16, was found to have the wooden packing boxes badly infested by a wood-boring insect, although the nuts themselves were apparently not attacked. A similar shipment reached Philadelphia about the same time and the same insect was found in the wood of the cases. Some idea of the capacity of the insect for damage to wood is furnished by the report on the shipment held at New York, which states that "the infestation was so severe that the cases are rapidly disintegrating and piles of wood dust are accumulating in their vicinity." The insect, identified as Heterobostrychus aequalis Waterh., is not known to occur in the United States. It is said to be destructive on dead or fallen wood, and does not attack the living tree. Although it has been recorded only on Bombax malabaricum, the silk cotton tree, its distribution is noted from 20 localities in Asia, the Asiatic Islands, and Madagascar.

DOMESTIC PLANT QUARANTINES

Post offices affected by quarantine revisions.--Recent revisions in quarantine regulations relating to the gypsy moth and to the pink bollworm of cotton have changed the areas under regulation, and accordingly a list of post offices affected by the revisions has been compiled and is being distributed as "Memorandum to Users of Miscellaneous Publication No. 189, 'Synopsis of Federal Plant Quarantines Affecting Interstate Shipments.'" The memorandum, dated October 10, shows the changes required in the above publication. The original synopsis was issued in February 1934 as a pocket-size manual for use of inspectors, transportation agents, and nurserymen. The supply of the manual is exhausted.

Transit inspection.--Transit inspection was resumed in the early part of October at Kansas City, Omaha, Council Bluffs, St. Paul, Spokane, Portland, and Seattle. At Chicago another inspector has been added to the force, and at both Chicago and New York State inspectors are again assisting in the work. Shipping is reported as well up to normal as to such material as bulbs but unusually light as to nursery stock. A package containing a cotton plant with both open and closed bolls, a cactus, 5 clusters of 5-needle pine, an oak cutting, a bunch of dead Spanish moss, a dead grasshopper, and a live praying mantis, all packed in Spanish moss and coming from the area in Florida infested with the pink bollworm, was recently intercepted at Chicago. It was turned back as a violation of Quarantine No. 52.

Pine-shipping permits.--The inspection of zones surrounding nurseries growing five-leaved pines under rust-free conditions has now been completed, with the exception of one nursery in the West. Twenty-one permits to ship such pines from infected States during the present fiscal year have been issued thus far. The permittees include Forest Service nurseries at Parsons, W. Va., and Haugan, Mont., and State nurseries at Charlottesville, Va., and Marietta, Ohio. Tentative approval of seed beds planted in 1933 and 1934 was also given in the case of five other premises, of which two were Forest Service nurseries.

Phony peach eradication.--Beginning on September 4, 10 extra men were employed in Georgia at the rate of $4 per day to assist in inspection work. All were men who had been previously employed in phony peach eradication and who had demonstrated ability to diagnose the disease in the field. With this increased force, and operating under the new system by which the orchard owner furnishes labor for actually cutting down the phony trees, a remarkable number of trees were inspected and a very large number of phony trees removed, the latter being due to the fact that an almost complete inspection of commercial orchards in Macon County was made for the first time in 3 years. The percentage of infection is very high in this county, more phony trees having to be removed there than in any other county in the State or country. As a result of this acceleration in the work, most of the inspections planned in the heavily infected territory around Fort Valley have been completed, in addition to inspections in several other counties which otherwise would not have been reached this season. Although it will not be possible to complete all the work needed in the State of Georgia, much more has been accomplished than was anticipated a month ago. Growers furnish labor for the actual destruction of phony trees. During September all inspectors but one were engaged in commercial-orchard work. One man, assisted by a State inspector, worked in the environs of peach-growing nurseries in an attempt to clean up a 2-mile area around each. This work has been nearly completed.

Citrus canker eradication.--A recurrent infection of the citrus canker was found on two Texas premises during the month of September. In one case a grapefruit tree was involved; in the other orchard, the infected plants were 3 satsuma trees and 4 Citrus trifoliata sprouts from satsuma roots. Recurrent infections of citrus canker have been found in these orchards, and frequent and regular inspections are being made of properties where sporadic occurrences of the canker are found. So far the disease is being held in check and is not spreading to other satsuma trees in these two orchards. Steps are being taken to completely eradicate citrus canker from this area. Both premises are some distance from other growing citrus trees in Galveston and Brazoria Counties. In Louisiana 1 infected sweet orange tree was found in September in the town of Houma, in Terrebonne Parish, in the same locality where 2 infected trees were found last year. As a precautionary measure, a total of 9 trees were destroyed, 8 of which were not infected with the disease. There are no other citrus trees near the property on which the infected tree was found.

IDENTIFICATION AND CLASSIFICATION OF INSECTS

Dr. Böving returns from Europe.--A. G. Böving has just returned to Washington from a 2-month trip to Europe. Most of his time was spent in Denmark, which he visited on the invitation of the leading scientific workers of the country and where he delivered lectures on the classification of the immature stages of the Coleoptera and on economic entomology in the United States. During the trip he worked in the Royal Danish Museum at Copenhagen, examined the collections of coleopterous larvae in the British Museum in London, and studied immature Coleoptera at the University at Cambridge, England. Dr. Böving reports a marked increase in interest in the study of immature Coleoptera.

A cotton moth from the Florida mainland.--A single female of the moth Anomis impasta Guen., labeled, "Florida City, Fla., Dec. 3, 1933, collected by L. E. Forsythe", has been identified recently by F. H. Benjamin for A. G. Richards. Previously the species had been recorded as reared from wild cotton on Long Key, south of Florida City, these collections coming from C. F. Rainwater, of this Bureau. Mr. Benjamin finds that this species is closely related to the common cotton leaf worm (Alabama argillacea Hbn.) and that it so closely resembles the latter that it may have been confused with it previously.

New distribution for Tortilia viatrix Busck.--The African senna moth, first discovered in bales of senna stored in warehouses in Hoboken, N. J., has been identified recently by August Busck from material sent in from Chattanooga, Tenn., in senna bales supposedly coming from Hoboken.

A recently recognized rice-infesting moth.--Carl Heinrich has been able to place larvae, pupae, and adults of a pyralid of the subfamily Pyraustinae, found in rice straw chiefly at quarantine in Philadelphia, as Susumia exigua (Butl.). Undetermined specimens in the national collection from Java, Southern Siam, and the Philippine Islands were shown by studies of the genitalia to be the same species. Nobukatsu Marumo, of the Tokyo Imperial University, Tokyo, Japan, who supplied Mr. Heinrich with information respecting his genus Susumia, also stated that the moth which has gone under the name Epimima nawae Matsumura is identical with Susumia exigua (Butl.). The available information suggests that this species is of some importance as a rice pest.

Rediscovery of Microbracon psilocorsi Vier.--Among some specimens received for identification from H. S. McConnell, of the University of Maryland, C. F. W. Muesebeck has recognized 10 specimens of Microbracon psilocorsi Vier., reared at College Park, Md., from Arogalea cristifasciella Chamb. and Psilocorsis obsoletella Zell. This is the first record of the appearance of M. psilocorsi since the parasite was described in 1912 from specimens reared at Cuero, Tex.

Hexachaeta spp. found in the United States.--Specimens of fruit flies collected last spring in Texas from baited traps were recently sent in by N. O. Berry for verification of his tentative determinations. The specimens were checked with specimens and literature by F. H. Benjamin and apparently represent the first record of the occurrence of Hexachaeta amabilis Loew and H. eximia Wied. in this country. The first species was originally described from Mexico. The second was described from Dutch Guiana, but is reported from Brazil and Mexico. There seems to be no information on record respecting the host relationships or other biological facts for any species of the genus.

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NEWS LETTER

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LEADERS DISCUSS WORK OF BUREAU

During the week of November 12-17 a series of full-day conferences was held in the office of the Chief of Bureau. These conferences were attended by the Division leaders of the Bureau and by the assistant leaders of the divisions whose work is headquartered in Washington. Each leader gave an informal talk on the work of his Division, which was followed by a general discussion of the material presented.

Some of the conferences were also attended by M. S. Eisenhower, Director of Information of the Department, and by W. W. Stockberger, Director of Personnel and Business Administration, both of whom addressed the conference regarding the lines of work with which they are associated. L. O. Howard and C. L. Marlatt also attended certain sessions and participated in the discussion.

On Wednesday, November 14, members of the conference had luncheon with the Secretary of Agriculture. At this time short talks were made by various individuals, discussing certain phases of the Bureau's work.

FRUIT INSECT INVESTIGATIONS

Dried fruit beetle found in grape pomace.--In samples of fermenting pomace examined by Dwight F. Barnes, of the dried-fruit insect laboratory at Fresno, Calif., in October, an average of 84 adults and more than 513 larvae of Carpophilus hemipterus L. per pound were found. The temperature of the pomace 4 inches below the surface, where the samples were taken, ranged from 100° to 109° F. Pupation was most abundant in the soil beneath the edges of the piles.

Injury by raisin moth larvae to three varieties of raisins.--Heber C. Donohoe, Fresno, Calif., reports that in a study of feeding injury by Ephestia figulilella Greg., he collected samples of raisins from trays stacked in vineyards and allowed the infestation in the samples to reach the stage of full-grown larvae. He then examined 12,376 raisins of three varieties for feeding injury and compared the number of injured berries with the number of larvae in the samples. The total number of injured berries, as compared with the infestation that developed in the samples, indicated a feeding per larva as follows: Thompson Seedless, 21.7; Sultana, 20.9; and Muscat, 9.2.

MEXICAN FRUIT FLY CONTROL

Mexican fruit fly still absent in lower Rio Grande Valley.--No specimens of the Mexican fruit fly were taken in the Texas groves, either in traps or in fruit; however, the operation of some 8,000 traps resulted in the taking of 8 adult specimens of Anastrepha fraterculus Wied., 1 of A. serpentina Wied., and 71 of A. pallens Coq. The pupation tray studies were continued throughout October but the only Anastrepha emerging were A. pallens, which were infesting coma berries. No Anastrepha were taken in the traps on the Mexican side of the river. Larvae of A. ludens, A. fraterculus, A. striata, and Rhagoletis sp. were recovered from imported fruits exposed for sale in the markets of Matamoros. The night office at Edinburg, Tex., which is the outlet of the valley, was opened near the middle of the month for the purpose of permitting trucks clearing the valley during the night hours. This office issues permits only to trucks that have obtained their cargoes from permitted packing houses, thereby relieving the various district inspectors of this night work.

DATE SCALE ERADICATION

Summary of October work.--From October 1 to 13 the crew at Indio, Calif., was in the Imperial Valley assisting in the inspection of the Reed Garden. During the remainder of the month the planting belonging to the Barker Brothers in the Indio district was inspected from the ground, and inspection of the smaller places in the Coachella district was begun. The scout crew covered this district from the ground and from ladders in February 1933 and from the ground only in September 1933. No scale has been found in this district since September 1930. In the Reed Garden the only planting that has shown scale during the fiscal year 1934 was carefully inspected and no scale was found. Three palms were found infested in this garden during the inspection of February 5 to 13, 1934. Since that time three inspections have been made--February 13-17, 1934; May 1934; and October 1934, and only dead scale on a palm previously treated was found. A total of 1,424 palms in the city of Calexico and in districts number 3 and number 4 were inspected from the ground, and 74 palms in the Noah Williams Garden were inspected from the ground and from ladders. In the Phoenix, Ariz., district 167 palms were inspected from the ground and a quarter of a section scouted for unlisted palms. In the Yuma, Ariz., district 469 palms were inspected from the ground.

CEREAL AND FORAGE INSECT INVESTIGATIONS

High vacuum kills flour beetle.--R. T. Cotton, Manhattan, Kans., reports that while conducting experiments on the vacuum fumigation of flour products, a considerable discrepancy was noted between results obtained with a small tank and those obtained with a large tank. The only difference in the method of operating the two tanks was the degree of vacuum obtained. With the large tank it was impossible to obtain more than a 26-inch vacuum, whereas with the small tank a vacuum of 29 inches could be drawn. An investigation of the effect of different degrees of vacuum revealed some interesting facts. In a 14-cubic foot vault loaded with 48-pound bags of flour in an initial vacuum of 26 inches, 3/4 ounce of liquid hydrocyanic acid for an exposure of 1 hour was required to give a 100-percent kill of confused flour beetles (Tribolium confusum Duv.) buried in the middle of the bags. With an initial vacuum of 28 inches, a dosage of 1/4 ounce HCN gave a 100-percent kill, and with an initial vacuum of 29 inches a dosage of only 1/8 ounce gave a perfect kill. Further investigations showed that the high vacuum alone had a marked effect on the flour beetles. A vacuum of 29 inches held for 4 hours gave a 100-percent kill, whereas a 28-inch vacuum did not. This effect of high vacuum on insects was observed by E. A. Back and Mr. Cotton several years ago. Some insects are quite resistant to high vacuum; however, the flour beetle is quite susceptible.

Hessian fly builds up population quickly.--E. T. Jones, Manhattan, Kans., reports that, although there is no general outbreak of hessian fly at these points, the fortuitous planting of test plots in favorable situations at Parsons, Kans., and Springfield, Mo., and an artificial infestation at Manhattan, Kans., have resulted in high infestations in the resistance test plots. Superficial examination of these plots has disclosed relatively heavy infestations of fly in practically every one of the 440 varieties, hybrids, and strains of wheat being tested for fly resistance at Manhattan and Parsons and about 300 being tested at Springfield. In some of the susceptible checks virtually 100 percent of the plants are infested. This is in striking contrast to the light infestations of the past few years in the resistant test plots at Wichita, Kans., where infestations in susceptible checks seldom exceeded 15 percent.

Drought controls pea aphid.--According to Mr. Jones, the drought and heat of the past summer have reduced the population of pea aphid (Illinoia pisi Kalt.) to a minimum at Manhattan, Kans. Sweepings made in many fields of alfalfa and vetch scattered through a number of counties have revealed but one infested field. This infestation, found in the shelter of a thick hedge, was so light that more than an hour's sweeping was required to collect 50 aphids. Apparently the same factors that have reduced the numbers of the pea aphid have not affected the abundance of the common wheat aphids, which seem to be more abundant than usual.

Grasshopper flights.--F. A. Morton, Bozeman, Mont., reports that daily records were kept of grasshopper flights during July and August at Langdon and Mohall, N. Dak., and during a part of July at Grassrange, Mont. Similar records were kept at Langdon and Mohall in 1933, and data for the two summers are tabulated below. Observations were made three times daily and the flight of maximum intensity is the one reported for a given day.

Location	Period	Days on which the flight was--				
		Light	Light to: moderate	Moderate	Moderate to: heavy	Heavy
		Number	Number	Number	Number	Number
Mohall------	July 1-Aug. 28, 1933	16	3	3	2	4
Do--------	July 1-Aug. 16, 1934	16	2	3	3	4
Langdon-----	July 14-Aug. 31, 1933	20	7	1	5	0
Do---------	July 1-Aug. 31, 1934	20	2	1	0	0
Grassrange--	July 10-29, 1934	9	2	0	0	2

As the observation period at Langdon did not begin until July 14 in 1933, it is certain that some of the heavier flights were not recorded and that there has been a decrease in aerial movements at that point since 1933. In 1934 most of the flights were to the south, southeast, or southwest, indicating considerable migration from nearby infested areas in Canada.

Insects reduce alfalfa-seed production.--Three insects were found to have a great bearing on the yield of alfalfa seed in Arizona during the past season. These insects were Lygus sp., a pentatomid, Chlorochroa sayi Stål., and a field cricket. The field cricket situation was especially noticeable in the Yuma section and injury to the second crop of seed was very heavy. L. L. Stitt, Tempe, Ariz., made some rather definite observations in the Yuma Valley and tabulated the percentage of injury as noticed in nine fields on each of the three major groups of insects affecting the yield of alfalfa seed at that point. His observations are as follows: Nine seed samples were collected for emergence of Bruchophagus funebris How. and its parasites, Tetrastichus bruchophagi Gahan, Liodontomerus sp., and Trimeromicrus maculatus Gahan; for brown seed injury; and for infestation by B. funebris. Some of the insects that damaged the seed crop were a species of Lygus, pentatomids (especially Chlorochroa sayi Stal.), and a field cricket. No determination has been made of this cricket, but it appears to be the common field cricket (Gryllus assimilis Fab.). Brown seeds are not productive and reduce the seed yield of alfalfa. The nine samples collected in the Yuma Valley were checked by making percentage counts. Brown seeds were very numerous, ranging from 24.88 to 97.29 percent, with an average of 57.08 percent. Chlorochroa sayi was abundant in the Yuma Valley. Both C. sayi and C. ligata Say have been observed feeding on the seed pods. Seeds shelled out of the alfalfa pods showed sucking injury. Sucking insects may not be responsible for all brown seeds but are a cause of reduced seed yields.

Hessian fly parasite found in Oregon.--The parasite Centrodora speciospissima (Girault), hitherto known only from the Eastern and Middle Western States, was reared from a hessian fly puparium collected near Forest Grove, Oreg., by Max M. Reeher. Six females and 1 male of this species emerged on September 20 and were determined by A. B. Gahan. This is the first record of the occurrence of this parasite in Oregon. The program for the introduction of the hessian fly parasite called for the attempted introduction of C. speciospissima into the Pacific Northwest. This is now unnecessary.

JAPANESE AND ASIATIC BEETLE INVESTIGATIONS

Japanese beetle attractants.--In a report on the control of the adult beetle by means of mechanical traps, F. W. Metzger, Moorestown, N. J., says: "Tests conducted during the past summer indicate that geraniol of very high quality is not essential for maximum attraction to the beetle. The cheap grades, known as technical or soap geraniol, vary widely in composition and not all such grades are satisfactory for use in attracting the Japanese beetle. A certain percentage of esters and aldehydes in geraniol does not inhibit attraction, but when these substances are present in the proper amounts they actually increase attraction. None of the constituents of geraniol are more than 60 percent as attractive as the recommended combination of geraniol and eugenol. When combined with eugenol at the usual rate, citronellol and geranyl acetate are more attractive than when used alone. The addition of eugenol, however, has very little influence on the attraction of citronellol, geraniol terpenes, or citronella oil. This investigation has made it possible to draw up standards for a cheap grade of geraniol which can be met by all manufacturers of this substance. Geraniol meeting these specifications is more attractive to the beetle than are the more expensive grades costing in quantity approximately $1.50 per pound, whereas the cheaper material can be obtained for about $1 per pound."

Stomach poisons for adult Japanese beetle.--According to W. E. Fleming and F. E. Baker, Moorestown, "In the report on Paris Green and Its Homologs as Insecticides for the Japanese Beetle; the effectiveness of the materials was expressed as the coefficient of the insecticidal action of lead arsenate, which was used as a standard insecticide. The relation between the coefficient of effectiveness of the materials and the concentration can be expressed mathematically by the equation

$$\underline{Y} = \underline{a} + \underline{b} . \underline{\log X}$$

where $\underline{Y}$ is the coefficient of effectiveness, $\underline{\log X}$ is the logarithm of the concentration, and $\underline{a}$ and $\underline{b}$ are constants. In a statistical evaluation of the coefficients, it appeared that copper crotono-arsenite was not significantly different from paris green and copper palmito-arsenite, but appeared to be significantly more effective than copper lauro-arsenite, rapeseed oil green, copper stearo-arsenite, soybean oil green, and copper oleo-arsenite. Paris green without a sticker was the most variable in its effectiveness. The addition of flour or an oil to the paris green reduced the variation in the insecticidal results. It was found that rapeseed oil green increased in effectiveness only to a slight extent by increments in concentration, and the greatest modification in effectiveness with change in concentration was obtained with copper crotono-arsenite, copper palmito-arsenite, and paris green with summer oil. There appeared to be no correlation between the water-soluble arsenious or the total arsenious oxide content of these materials and their effectiveness as insecticides. Paris green, copper crotono-arsenite, and copper palmito-arsenite, the most effective of these materials, prevented extensive feeding by the beetles when used at the rate of 8 pounds to 100 gallons of water. Most of the other materials had to be used at the rate of 16 pounds to 100 gallons to accomplish this result.

However, paris green and its homologs caused some injury to foliage at concentrations below that at which the beetles were largely deterred from feeding. It may be concluded from this investigation that paris green and its homologs are inferior to acid lead arsenate in killing the Japanese beetle, and in their present form cannot be used to protect foliage from attack by this insect without causing spray injury."

Derris and the Japanese beetle.--In the report on Derris and Its Constituents as Insecticides and Repellents against the Japanese Beetle, along with Tests with Miscellaneous Materials, Messrs. Fleming and Baker state that "the results were obtained under artificial conditions of heavy infestation in the constant-temperature rooms, according to the procedure outlined in Jour. Agr. Research 48:115-130; 49:39-44, 1934, which was the same as that used in the study of paris green and its homologs. Under these conditions complete protection was given to the fruit and foliage of Yellow Transparent apples by the application of sprays containing derris or rotenone. Lime sprays did not protect the fruit from attack, although the feeding on the foliage was somewhat reduced. Beetles fed to only a limited extent on fruit sprayed with acid lead arsenate. It was demonstrated that hellebore and pyrethrum have no value as stomach poisons or as repellents against the Japanese beetle. Derris is a weak stomach poison but a definite repellent. The repellent action of derris appears to be due to the rotenone and deguelin. Toxicarol, tephrosin, and the resinous residue, after the crystalline materials have been extracted, appear to be of no value as repellents. Deguelin was found to be equal to neutral potassium oleate soap, when tested according to the procedure outlined in Jour. Agr. Research 49:29-38, 1934, and rotenone was 2.3 times as effective. Derris used alone was only about one-third as effective, but when 0.125 percent potassium coconut oil soap, an amount below that effective against the beetle, was added, derris became 1.76 times more effective than the standard. Exposure to ultraviolet light definitely decreased the effectiveness of derris, rotenone, and deguelin as repellents. The addition of sodium silicate solutions to derris sprays destroyed the repellent value of the deposit on foliage. Derris is readily washed from foliage. The action of rain in the field is believed to be one of the most important, if not the most important factor, in limiting the effectiveness of derris sprays. Several materials were tested as stickers for derris, the most promising being a paraffin emulsion."

JAPANESE BEETLE CONTROL

Chain store fined for violating Japanese beetle quarantine.--Finding of a Japanese beetle in a quart of huckleberries being prepared for a pie by the proprietress of a tea room in Warrenton, Va., culminated in a fine of $125 being imposed upon The Great Atlantic & Pacific Tea Company of New Jersey for illegal transportation of uncertified huckleberries from their District of Columbia warehouse to their Warrenton store. Some of the huckleberries moved to Warrenton were from Hammonton, N. J., a section densely infested with the beetle. Thirty-six traps set in Warrenton this year caught 10 beetles.

Extensive heeling-in areas fumigated.--Nurseries desiring certified heeling-in or plunging areas in the open field after August 1 are obliged to treat the surface soil with a fumigant. Accordingly, a number of nurseries recently fumigated rather extensive areas with raw carbon disulphide. At a large nursery in New Jersey a total of 10,194 square feet of plunging area was treated with a total dosage of 612 pounds of fumigant. Sufficient canvas was available to treat approximately 2,700 square feet at one time. After 48 hours the tarpaulin was removed and another section was treated. In this method of fumigation, carbon disulphide is uniformly distributed over the surface of the soil by applying it in holes 12 inches apart and from 1 to 2 inches deep, putting 21 cc in each hole. As soon as the fumigant is applied the ground is immediately covered with a gas-proof cover. In treating 2,742 square feet of surface soil in a heeling-in area in the blueberry-growing section of New Jersey, carbon disulphide emulsion was used. With this method, specified dosages of dilute carbon disulphide emulsion are poured into galvanized-iron collars forced into the ground over the entire treated surface. Other fumigation activities included carbon disulphide treatment of about 25 tons of potting and bench soil for a nursery in Chester County, Pa.

Cut-flower inspection discontinued.--As provided in the quarantine regulations, the inspection requirements on the movement of cut flowers from the Japanese beetle regulated zone were removed on and after October 16. This permitted the dismissal of eight temporary inspectors engaged in this work. The last beetles were found on cut flowers inspected in Philadelphia wholesale houses on October 4. Cool weather probably accounted for the few adults surviving. The last beetle found by the inspection force was collected in a field near Easton, Pa., on October 17.

New gypsy moth activities in New England.--Christmas tree cutting in Vermont started during the last week in October, will increase rapidly during the first half of November, and continue through that month. The recent revision of the gypsy moth quarantine regulations eliminated from the regulated area a considerable portion of Vermont from which Christmas trees are shipped in quantity. This will reduce the volume of trees inspected and certified. The cutting of balsam trees in Maine will start after the first good freeze, probably early in November. These seasonal activities add to the inspection work of the district inspectors. From 3 to 4 inches of snow fell on the mountains at Rutland, Vt., late in October. On October 22, the Granite State Quarry at Concord, N. H., resumed the cutting of paving blocks. This is the first paving cut in Concord for 3 years. About 25,000 blocks will be cut and shipped under gypsy moth certification. Also, some 50,000 blocks that have been piled in the open for 3 years will be shipped under certification. Large numbers of egg clusters will probably be found when the old blocks are handled.

More road-inspection stations in New England.--Ten additional vehicular-inspection stations were established between October 15 and 19 on important highways carrying traffic from the lightly infested gypsy moth area. Schedules call for operation of four of the posts for 12 hours daily. The remaining six posts will be operated on a staggered daily schedule of 6 hours each. Sixteen men are assigned to the new stations. Shortly after the opening of a post at Cheshire, Conn., a gypsy moth egg cluster was found on maple cordwood being transported from Pelham, Mass., to Port Chester, N. Y.

Autumn defoliation ends scouting for Dutch elm disease.--Scouting in the vicinity of the elm found infected with the Dutch elm disease at Old Lyme, Conn., was concluded on October 20, due to unfavorable scouting conditions. Four Federal and two State scouts completed an area 5 to 10 miles in width bordering Long Island from Guilford, Conn., to the Rhode Island line. Samples were taken from 163 suspected trees. Of those now cultured, none have been found infected with the Dutch elm disease. The European elm bark beetle (*Scolytus multistriatus* Marsh.), the principal carrier of the disease in the heavily infected area, was not observed by the scouts. The native elm bark beetle (*Hylurgopinus rufipes* Eich.) and the snout beetles *Magdalis* spp. were reported over the entire area covered. Brisk autumn winds late in October almost completely defoliated the elms in New Jersey. During the latter part of October New Jersey scouts were engaged in locating and tagging dead and dying elms.

Garden club assists in fight on Dutch elm disease.--Effective cooperation in Dutch elm disease control has been extended by the garden club of Fairfield, Conn. Supporting a club resolution to actively participate in the fight on the disease, funds were made available for a survey of the community.

Virginia promulgates intrastate corn borer quarantine.--G. W. Koiner, commissioner of agriculture and immigration of Virginia, on October 4 approved a quarantine prohibiting the shipment of certain likely carriers of corn borer infestation from Accomac and Northampton Counties to other parts of the State. All public carriers, including railroads, boats, ferries, and trucks, have been urged to comply with the regulations. Since extensive State surveys have failed to locate the pest on the mainland of Virginia, the quarantine will be enforced to confine the infestation to the Eastern Shore.

Lime dust protects dahlias against insects.--During the dahlia-growing season, Long Island growers reported insect damage other than that caused by corn borers. This feeding sometimes stunted the plants. Various sprays and dusts were used. In one of the largest dahlia fields on the Island it was found that an inexpensive lime dust was as effective as any control method tried. Second-generation corn borer larvae were observed on Long Island by the middle of October.

FOREST INSECT INVESTIGATIONS

Parasite of oriental moth winterkilled in Massachusetts.--R. T. Webber, of the Melrose Highlands, Mass., field laboratory, reports that the severe winter of 1933-34 seriously interfered with the effectiveness of the introduced tachinid fly *Chaetexorista javana* B. B. which, since its importation from Japan in 1929 and 1930 and libertation in Boston and vicinity, has each year become increasingly important as a parasite of the oriental moth (*Cnidocampa flavescens* Walk.). During April 1934 a total of 652 cocoons of the oriental moth were collected from four localities. From these, 212 moths later issued but no adults of the tachinid were obtained. Dissections of the unissued cocoons showed that all *C. javana* maggots were dead. In contrast with these results, 74 *C. javana* adults issued from 153 cocoons collected from the same localities in November 1933. It is therefore evident that *C. flavescens* was not greatly affected by the cold winter, whereas the opposite is true for *C. javana*. It should be stated, however, that the cocoons collected in April were taken from situations where they had not been protected by snow or other covering, and it is hoped that maggots in cocoons so protected were not so seriously affected.

Two sprayings control European pine shoot moth.--C. E. Hood, Melrose Highlands, has examined pine buds from plots in Branford, Conn., that were sprayed in June for the control of the European pine shoot moth. In these experiments several different mixtures were tested. The examinations indicate that the best control was obtained in the plot sprayed with 4 pounds of lead arsenate and 4 pounds of bentonite to 100 gallons of water, with fish oil added as an adhesive, on June 15 and resprayed on June 28. In the samples examined 19.2 percent of the buds showed injury and 5.7 percent contained living larvae. Samples collected in the check plot showed that 69.5 percent of the buds were injured and that 36.6 percent contained living larvae. The plots will be examined again next spring when injury on the new growth is expected to be conspicuous.

Bark-beetle survey in Idaho.--J. C. Evenden, of the Coeur d'Alene, Idaho, field laboratory, reports that early in October he made an examination of the white pine stands of the Clearwater National Forest, where a rather severe infestation of the mountain pine beetle was recorded. A large percentage of the lodgepole pine of this forest has been destroyed by these beetles in an outbreak which during the past few years has spread northward from the Selway and Nezperce Forests. The white pine infestation undoubtedly originated from this same source. To obtain more detailed data relative to the white pine infestation, not only on the national forest lands but on adjacent private timber stands, an extensive survey of the infested areas was instituted on October 10. This survey, which will be completed early in November, will aid in determining the advisability of instituting control measures in the spring of 1935.

Tree medication reduces mountain pine beetle infestation.--W. D. Bedard, Coeur d'Alene, reports that an examination of the experimental medication area on the Kaniksu National Forest in eastern Washington showed a very satisfactory reduction in the mountain pine beetle infestation, notwithstanding the number of windfalls and other trees that were missed. Experimental control work was done in this area in the fall of 1933 by injecting the infested white pines with a solution of 4 ounces of sodium arsenate in 3 quarts of water. The medicated trees were felled and examined in June 1934, and at this time the high mortality in most of the trees indicated that there would be a substantial reduction in the infestation. This expectation was fulfilled, in that a survey of 10.5 percent of the area showed an infestation of 0.258 tree per acre, as compared with 0.395 tree per acre before treatment. Although the bark beetle broods were reduced by the injection, the braconid parasite Coeloides dendroctoni Cush. appeared to be unaffected by the poison and emerged in normal numbers from the medicated trees. This normal emergence of parasites, coupled with the reduction in infestation, was evident in the higher parasitization during the 1934 season.

Hemlock in Massachusetts defoliated by a spanworm.--H. J. MacAloney, of the New Haven, Conn., field laboratory, reports that he and J. V. Schaffner, Jr., of the Melrose Highlands, Mass., laboratory, have observed serious defoliation of hemlock by a hemlock looper on the Erving, Mass., State Forest and on adjacent private lands. The infestation covers about 50 acres, of which about 10 acres have suffered complete defoliation and some of the trees are dead. This spanworm was still in the pupal stage late in October and perhaps will not transform till spring. Slight defoliation by the common strain of Ellopia was also observed at the Harvard Forest, at Petersham, Mass., where the moths emerged in September as usual.

White pine weevil work complicated by a disease.--In some of the sample plots on reclamation of severely weeviled white pine stands in Massachusetts, a serious complication has arisen, reports Mr. MacAloney. On cuts larger than 2-1/2 inches a serious balsam rot, caused by the fungus Stereum sanguinolentum, is present. This fungus is a heart rot and will undoubtedly cause death wherever it has a chance to enter. Cuts, therefore, should be no larger than will be covered with the flow of pitch, or painting will have to be done. There is no evidence of the fungus on cuts on the smaller limbs. This also means that it is inadvisable to cut out one stem of a fork if the tree has attained a diameter of more than 2 inches at the point of forking.

GYPSY AND BROWN-TAIL MOTH CONTROL

Progress in gypsy moth work.--During October it was necessary to continue the patrolling of barbed-wire fences erected around sprayed areas at a number of locations, because the owners continued to use adjoining property for pasturage. In some sprayed areas the owners have moved livestock to other pastures and this permitted the taking down of considerable wire which was returned to the storehouse. Scouting work was continued in certain towns in Vermont, Massachusetts, Connecticut, and Pennsylvania. In the last-named State there was considerable general woodland scouting, also some around the sites of assembling cages that have attracted male moths during last summer. Some scouting was also performed along river banks and in lowlands so as to complete this work before high water should carry infested materials to uninfested sections.

Thousands of gypsy moth egg clusters treated by conservation-corps workers.--At the V. C. C. and C. C. C. camps the men engaged in gypsy moth work have been devoting a good deal of their time to old infestations that were discovered last year. Particularly careful work is being done at such infestations and many thousand gypsy moth egg clusters have been destroyed. A considerable amount of work done this fall has been performed in areas where the trees were burlapped last summer and where many gypsy moth caterpillars and pupae were killed.

PLANT DISEASE CONTROL

Quarantine 38 effective in barberry eradication.--One phase of the barberry-eradication program which will have a definite bearing on the ultimate success of the stem rust control program is the effective application of Quarantine No. 38 (revised), which prohibits the interstate shipment of Berberis plants susceptible to stem rust into or between the 13 North Central States participating in the eradication program.

Barberry susceptibility tests.--There are in the United States some 200 species, varieties, and hybrids of Berberis. Some 30 or 40 of these are grown extensively in nurseries. Many are propagated under trade names and their true identification may be unknown. At frequent intervals new varieties are introduced or new hybrids developed. To assist in the identification and classification of existing plants and to determine their reaction to the stem rust fungus, barberry plots have been established at the Foreign Plant Introduction Garden at Bell, Md. Approximately 100 species and hybrids of barberry have been collected and planted. In addition, seed has been collected from bushes growing in nurseries throughout the United States and planted for future observations. These will be tested to determine whether first-generation and second-generation seedlings will react to the fungus in the same manner as does the parent stock. During the month of September the first outdoor susceptibility test was conducted at Bell. An unusual amount of moisture had produced succulent growth and other weather conditions were favorable for the test. Excellent results were obtained. Similar tests will be conducted in the spring and fall of next year.

Over 4,000 acres of nursery stock inspected for stem rust.--During the past summer 21 nurseries, comprising 4,478 acres of nursery stock, were inspected. All species of barberry susceptible to stem rust were destroyed or otherwise disposed of and many questionable varieties were identified. The species and varieties for which the rust reaction had not been determined were collected for testing purposes. Nurseries free of barberries susceptible to stem rust are given permits allowing interstate shipment of barberry that is immune or highly resistant to the stem rust fungus.

Many varieties of barberry carry rust.--More than 100 varieties of barberry are known to be susceptible in varying degrees to the stem rust fungus. Between 30 and 40 varieties have been determined to be immune or sufficiently resistant to permit propagation within the barberry-eradication area without creating a rust hazard. Future tests of questionable varieties will be conducted under controlled conditions in both field and greenhouse.

Ribes eradication in 1934--summary.--Ribes-eradication work for the protection of valuable white pine stands was brought to a close for the season during September in most of the areas where this work was in progress. During the active season, extending from early in May through September, very satisfactory progress was made on this project. The following table shows the results of the season's work by pine regions:

Region	Total area worked	Total labor	Total Ribes eradicated	Ribes eradicate per acre	
	Acres	Man-days	Number	Number	Man-days
Northeastern States---	756,942	207,045	22,450,142	30	0.27
North Central and Lake States---------	395,785	132,288	38,571,365	97	0.33
Southern Appalachian States--------------	867,459	67,515	2,069,995	2	0.08
Western States---------	880,094	545,488	132,642,707	151	0.62
All----------------	2,900,280	952,336	195,734,209	67	0.33

The remainder of the work season will be devoted to pre-eradication surveys in preparation for next season's work.

Blister rust control in the southern Appalachian States.--In general the work of Ribes eradication in the southern Appalachian district for the season of 1934 was finished by October 15. However, owing to the lack of freezing weather, eradication of cultivated Ribes near valuable pine areas was being carried on in North Carolina, South Carolina, and Georgia throughout the month. In Virginia, eradication work was carfied on through October. Excellent progress was made in the control work during the past season, but there still remains in each State a considerable area in which no mapping of pine or Ribes eradication has been carried on. During the month of October the blister rust was discovered for the first time on Ribes in Nelson County, Va., within the boundary of the Natural Bridge division of the George Washington National Forest. This represents ~~a further southern extension of the disease in the~~ Appalachian region of about 25 miles. The foresters in the Shenandoah National Park are planning on removing diseased branches from white pines along Skyline Drive.

New blister rust infection centers found.--Blister rust infection on white pines has recently been reported for the first time in several new counties. Diseased white pines were found for the first time in Ohio, near Chagrin Falls in Geauga County. The rust was also found for the first time in Iowa on native white pine and wild Ribes in Dubuque County. In Maryland, Allegany County has been added to the list of counties having infected white pines. In lower Michigan, infections on native white pines have been reported for the first time in Leelanau, Emmet, Otsego, Alcona, and Sanilac Counties. Most of the cankers are of recent origin, indicating that the disease is just becoming established on the pine.

COTTON INSECT INVESTIGATIONS

Effect of defoliation on boll weevil movement.--The effect of defoliation of cotton by leafworms on the field movement of boll weevils was shown by the weevils caught on flight screens, as reported by G. L. Smith, J. C. Clark, and A. L. Scales, of Tallulah, La. Most of the weevils caught during October were taken at one reading following the defoliation of the fields by the leaf worms, and over half of the total number of weevils were taken from two fields that were completely defoliated in a very few days. The average number of weevils per screen, taken in the different classes of fields, was as follows: On 4 screens in fields not defoliated, 29; on 3 screens in fields partially defoliated by October 25, 58; on 5 screens in fields totally defoliated by October 25, 147.

Boll weevil parasites in cotton collections from 11 States.--During the past season collections of infested cotton squares were made in all of the States where the boll weevil occurs, except Virginia. The infested material was placed in cages at Tallulah, La., and from the 214,538 cotton squares, 92,662 boll weevils and 3,913 parasites emerged. Altogether 528 collections were made in 118 counties of the 11 States. Although the percentage of parasitization based on squares producing either weevils or parasites, was only 4.05, and the percentage of parasitization, based on the total number of squares caged, was only 1.82, there were striking variations in the percentage of parasitization from different States and from different fields. Some collections of squares producted no parasites, while one contained 82 percent. More fields with a high percentage of parasitization were found in Georgia than in any other State. The percentage of parasites from collections in certain fields in the other States went as high as 43 in North Carolina, 38 in Alabama, 37 in Mississippi, 33 in Oklahoma, 26 in Texas, 22 in South Carolina, 4 in Arkansas and Louisiana, 2 in Tennessee, and 1 in Florida. Over 70 percent of all parasites reared were Microbracon mellitor Say.

Pilosity of cotton plants.--Among the characters of the cotton plant that are being studied by E. W. Dunnam, Stoneville, Miss., in his search for boll weevil-resisting characters, is pilosity of the leaves and stems. Representative cotton-plant samples, aggregating 250, were collected from each variety growing at each station for pilosity studies, which are now being made. This work shows that there is a considerable variation in the distribution of the hairs on the various parts of individual plants, as well as on similar parts of the individual plants. Of 80 varieties studied, pure Sea Island was the only variety entirely devoid of hairs on all parts of the plant, except on the lower epidermis of the leaves. Egyptian Pima was the only other variety that had no hairs on leaf petioles. No varieties studied had hairs on the inner epidermis of bracts, with the exception of Missdel No. 4, Rowden No. 5031, and D. and P. L. Station. The only variety having more hairs on the upper than on the lower surface of leaves was D. and P. L. No. 10.

Boll weevils in wild cotton.--In order to definitely answer the question as to whether or not the boll weevil of the Eastern States will develop in Thurberia thespesioides, the so-called wild cotton of Arizona, plants were grown this season at several places. F. F. Bondy, Florence, S. C., and R. C. Gaines, Tallulah, La., have now reported that boll weevils fed on, oviposited in, and developed normally to the adult stage in the buds of the Thurberia plant growing in the open under field conditions adjacent to cotton.

Flea hopper abundance.--Collections on flight screens and by sweeping, reported by K. P. Ewing and R. L. McGarr, Port Lavaca, Tex., show an abundance of cotton flea hoppers this fall. About five times as many hoppers were taken on the screens this October as last year, most of them being caught during the first 2 weeks of the month. There was a heavy flea hopper infestation in cotton in the Port Lavaca section this summer and the late summer rains have produced an abundant growth of croton plants. With the large numbers of hoppers present in October and plenty of host plants for egg laying, conditions appear very favorable for a large carry-over.

Heteroptera damage cotton in Arizona.--T. P. Cassidy and T. C. Barber, of Tucson, Ariz., have shown by their cage experiments this summer that several heteropterous insects are responsible for the staining of cotton lint, which is such a serious problem in Arizona. The most important insects known to cause staining in Arizona are Euschistus impictiventris Stal. and Chlorochroa sayi Stal. In a recent survey covering the five cotton-growing counties of the State, 23.3 percent of the bolls were found to be punctured by insects of this group.

PINK BOLLWORM AND THURBERIA WEEVIL CONTROL

Pink bollworm findings.--The most important development, as a result of gin-trash inspection during October, was the finding of reinfestation in Midland and Martin Counties, Tex. The first specimen, a living larva, was found in Midland County on October 18, and two other living specimens were found the following week. The last previous finding in this county was in the 1931 crop. Some cotton from Ector and Andrews Counties is also ginned at Midland and, as a result, all three counties are involved in the findings. On October 24 a specimen which had apparently been dead only a short time was found in Martin County. All inspections in these counties have since been negative.

Gin-trash inspection closing down.--Gin-trash inspection has been completed in Alabama, Florida, and Georgia, no important findings having been made since the last News Letter was issued. Inspections are going forward in the Salt River Valley of Arizona and in the Thurberia weevil area in Pima County, Ariz., all results having been negative to date. Specimens have been found in some of the older regulated areas; namely, the Safford Valley of Arizona, the Pecos Valley of Texas, and the Mesilla Valley of New Mexico. In most of these areas gin-trash inspection as a general practice has been discontinued. Instead, green bolls have been collected and will be inspected a little later in the season. This should give a more accurate indication of the degree of infestation.

Clean-up for pink bollworm will soon begin.--For the last two seasons a field clean-up has been carried on in the Big Bend area of Texas for the purpose of reducing the heavy infestation and thereby eliminating the danger of spread to other areas. The practice will again be followed this season, and clean-up work was begun the latter part of the month. Farmers are rushing the picking of their remaining cotton as much as possible so as to get the fields ready. It is expected that with favorable weather the work will be completed much earlie this year. As an example of the cooperation we are receiving, a farmer was recently offered approximately $400 for the right to pasture cattle on his farm. Being strongly in favor of the clean-up, he refused the offer.

Pink bollworm found at Marfa, Tex.--The first finding of pink bollworm specimens in material confiscated at the Marfa, Tex., road station this season was made on October 17, on which date 1 dead larva was found in seed cotton taken from a truck. On October 24, 1 dead and 6 living larvae were found in seed cotto taken from another truck. On October 31, 1 dead and 5 living larvae were found in two cotton bolls that were being taken to Michigan as souvenirs.

TRUCK CROP AND GARDEN INSECT INVESTIGATIONS

Conference on beet leafhopper.--During the period from October 18 to 21 a conference of the workers on the beet leafhopper was held at Modesto, Calif. In addition to representatives of the Bureau's field laboratories at Modesto, Twin Falls, Idaho, Salt Lake City, Utah, and Grand Junction, Colo., the conference was attended by Eubanks Carsner and N. J. Giddings, of the Bureau of Plant Industry, H. H. P. Severin, J. H. Freitag, and C. G. Weigle, of the University of California, and W. H. White, of this Bureau.

Pea weevil causes losses in cannery peas.--A. O. Larson, of the Corvallis, Oreg., field laboratory, reports that field examinations in the pea-growing districts of that State have revealed a very heavy loss in the harvest of cannery peas owing to the pea weevil. In some of the fields examined, practically all the pods contained peas infested by the weevil. Special observations conducted in certain of these fields indicated a rate of loss of more than 2 tons of green pods per acre.

Derris effective against Mexican bean beetle.--L. W. Brannon, of the Norfolks, Va., field laboratory, reports that derris dust containing 0.75 percent rotenone, or derris root powder used as a spray containing 0.03 percent rotenone (2.5 pounds of derris root powder containing 5 percent rotenone per 50 gallons of water), were very effective in controlling the Mexican bean beetle on snap beans at Onley on the Eastern Shore of Virginia. Of the various diluents used as a carrier for derris, it appeared that talc had the best dusting qualities and was cheaper than ground marc or tobacco dust. When influsorial earth was used as a carrier, poor foliage protection resulted, and the increase in yield of beans was less than half that obtained from plants tested with the derris-talc dust mixture. A commercial derris-dust mixture, containing 0.55 percent rotenone, increased the yield only about one-half over that obtained from the derris-talc mixture containing 0.75 percent rotenone. In this series of tests the derris root powder used as a spray resulted in better increases in yield of the treated plants than any of the other spray materials. Similar tests at Norfolk, Va., demonstrated that 2.5 pounds of the derris root powder (5 percent rotenone) per 50 gallons of water, gave better foliage protection from the bean beetle than when the material was used at the rate of 1.5-50 strength, or with bentonite sulphur, powdered white soap, or miscible pine oil.

Timing of treatments improves bean beetle control.--L. W. Brannon, Norfolk, reports that in a series of experiments on snap beans at Onley, the best foliage protection from the Mexican bean beetle was obtained from four insecticide applications at approximately weekly intervals. Also, the results of these tests indicated that of these four treatments, the first and fourth (applied when the plants were beginning to develop the first trifoliate leaves and again when in full bloom) were the most important in controlling the bean beetle, under the conditions existing on the Eastern Shore of Virginia.

Fluorine compounds most effective against tomato pinworm.--R. E. Campbell and J. C. Elmore, of the Alhambra, Calif., field laboratory, report that in preliminary tests against the tomato pinworm (*Gnorimoschema lycopersicella*

Busck), which has been causing severe damage to tomatoes in southern California during 1934, the fluorine compounds were most effective in reducing the number of larvae per plant. The materials tested also included derris, nicotine, pyrethrum, and paris green.

Wettable sulphur sprays give best control of redberry mite in Washington.--S. E. Crumb, of the Puyallup, Wash., field laboratory, reports that during 1933-34, the wettable sulphur spray (5-100) gave generally superior results to lime sulphur (1-40) or other insecticides tested in the control of Eriophyes essigi Hassan on blackberry. A dormant (spring) application of lime sulphur (8-100) proved superior to a fall application in controlling the mite and also increased the yield of berries. When three or more spray applications were made a lower yield resulted than when but two sprays were used.

Effectiveness of calcium cyanide against potato tuber moth.--H. H. Richardson, of the greenhouse-insects laboratory, Washington, D. C., conducted some tests in a standard fumigation box to determine the effect of calcium cyanide fumigation on the moths of the potato tuber worm as a possible indication of this method of control for a closely related species, the tomato pin worm, which is becoming quite a pest in some of the greenhouses in Pennsylvania and Delaware. The results indicate that a dosage of 1/8 ounce per 1,000 cubic feet of space has no effect on the moths. This dosage, under fumigation-box conditions with its 17-hour exposure, is easily equal to 3/16 or 1/4 ounce dosage in an overnight fumigation in a fairly tight greenhouse. As 1/8 ounce is the highest dosage that can be used with safety in fumigating tomatoes, little likelihood appears that this fumigant would be effective on the growing crop under practical greenhouse conditions.

Fumigation of mushroom houses at peak heat.--A. C. Davis, of the Takoma Park, Md., laboratory, continuing his studies on the fumigation of mushroom houses, reports that hydrocyanic acid gas, generated from either sodium cyanide or liquid hydrocyanic acid, gave a much higher concentration than did calcium cyanide when equivalent dosages of all three were used. Calcium cyanide in granular form gave a peak concentration that averaged 0.89 mg per liter, and dropped below 0.4 mg per liter in 55 minutes. From 10 to 15 minutes was required to reach peak concentration. Calcium cyanide dust gave a slightly higher concentration, over a longer time, but was still too low to be effective at the temperatures found at floor level in mushroom houses. The dust is more dangerous to use in the ordinary manner than is the granular form. Gas from sodium cyanide and acid and from liquid hydrocyanic acid forced into the house through a pipeline gave peak concentrations of nearly 3 mg per liter in from 3 to 5 minutes, requiring from 55 to 62 minutes to drop below 0.4 mg per liter, the average. The cost per fumigation with sodium cyanide and acid is less than half that with either calcium cyanide or liquid hydrocyanic acid. Tests run in the fumigation chamber indicate that the concentrations obtained in the mushroom houses should be nearly 100 percent lethal.

Heavy rains reduce tobacco fleabeetle population.--F. S. Chamberlin, of the Quincy, Fla., laboratory, reports that heavy rains are quite detrimental to adults of the tobacco fleabeetle, the reduction ranging from approximately 90 to 95 percent, as compared with the numbers on plants that were protected from the rain by a special cage device.

INSECTS AFFECTING MAN AND ANIMALS

Screw worm infests Gulf coast from Florida to Texas.--A recent survey by E. W. Laake in the counties of Liberty, Jefferson, and Orange in southeastern Texas, shows that the present screw worm infestation is continuous along the coastal region of the Gulf States into Texas. The following is quoted from Dr. Laake's report: "Many interesting factors have been observed in this survey in various counties, especially with reference to what might be accomplished where calving and certain operations are not practiced during the screw worm season. A good example of this is seen in Orange County and Calcasieu and Cameron Parishes. One ranch at Orange, Tex., has 2,500 cattle in Calcasieu Parish, La., 1,000 in Cameron Parish, La., and 2,000 in Orange County, Tex. As the grazing area in Calcasieu and Cameron Parishes is all open and ranchers have no control over the breeding season, there is a screw worm infestation in cattle amounting to over 10 percent in the 3,500 animals located in those two parishes, whereas the infestation did not exceed 5 percent in the 2,000 animals in Orange County, where the ranches are fenced and where summer calves are not permitted to drop. As these two parishes are separated from Orange County only by the river, certainly no other factors except those indicated above could be responsible for the much heavier infestation in the herds in the Louisiana territory." In Georgia, Florida, and Mississippi the educational campaign for screw worm control has been continued in cooperation with the F. E. R. A. and interested State agencies.

Screw worms in Iowa.--A sporadic infestation of screw worms in Plymouth and other counties in northwestern Iowa was reported during the month. A survey of the infested territory was made by E. F. Knipling, of the Ames, Iowa, laboratory.

Liberation of the blowfly parasite (Alysia ridibunda Say).--A. W. Lindquist reports: "A total of 9,220 A. ridibunda have been released at 161 locations up to a distance of 25 miles in all directions from Uvalde, Tex. The number of parasites released at each point has ranged from 25 to 300, and with an average of about 60. More females than males have been liberated. The colonizations have been scattered so as to cover as great an area as possible, rather than concentrate hundreds at one locality, because the establishment of the parasite apparently depends upon whether the female finds a carcass of suitable age and development within a short time after release. By covering a comparatively large area, it is hoped that carrion would be available for the parasites near at least a few of the colonizations. No provision has been made for distributing infested carrion. However, releases have been made at dove-hunting grounds, where it is highly probable that hunters have lost dead and wounded birds. Also, sites have been chosen where much small animal life was believed to exist and, in a few instances, liberations have been made near carcasses. We have not been able to get the parasite through on Cochliomyia macellaria Fab. in the laboratory, and it appears that the building up of the species must be in small carcasses containing a high percentage of Sarcophaga and Lucilia larvae. Alysia has been observed on carrion after releases, has been recovered in the regular Kennedy status jars, and in one case a second generation of a small release made on September 6 has apparently been recovered. A liberation of 300 Alysia made on October 2 at a brush pile was observed on the following 4 days. Most of the males stayed at the brush and ever so often made short upward, circular flights and returned to the brush. Very probably the males remain close to the emergence site and copulation occurs close by."

Bot flies survive low temperature.--R. W. Wells reports that the minimum temperature for the season at Ames, Iowa, 19° F., was recorded on the nights of October 28 and November 1. Both Gastrophilus nasalis L. and G. intestinalis DeG. were active on November 7.

A city bureau of insect control.--The City Council of Portland, Oreg., has set up a Bureau of Insect Control. H. H. Stage acted in an advisory capacity with the committee that drafted the ordinance creating it. It is believed that the ordinance creating this bureau is somewhat unique in city legislation. Section 1 reads as follows: "There is hereby created the Bureau of Insect Control. Said bureau shall have control over all nuisances created by earwigs, elm leaf beetle, mosquitoes, and all other injurious insects affecting premises, buildings, trees, or shrubs within the corporate limits of the city; and earwigs, elm tree beetles, mosquitoes, and other insects are hereby declared to be a nuisance. The Bureau of Insect Control shall be administered by and under the supervision of a city insectarian, which position of city insectarian is hereby created. The duties of said city insectarian shall be to supervise the eradication of earwigs, elm leaf beetles, mosquitoes, and other injurious insects affecting premises, buildings, trees, or shrubs within the city; and to that end said city insectarian or his assistants or employees in the Bureau of Insect Control shall have power and authority to enter into and upon any premises in the city for the purpose of inspecting the same to determine the presence of earwigs, elm leaf beetles, mosquitoes, and all other injurious insects, whether same are on the premises or in the buildings, trees, or shrubs, and if it shall be determined from such inspection that any such nuisances exist on any such premises in any buildings, on any trees or shrubs, or in any other places within the city, such city insectarian shall, either directly or through his assistants or employees in the Bureau of Insect Control, take immediate action to abate the same in such manner as may be deemed proper to accomplish such purpose. The same city insectarian shall have power and authority to confer with and receive gratuitous service and advice from persons trained in such work, or such entomologists of Oregon State College or any bureau of the United States Government or employee of the United States Government engaged in such work. Said Bureau of Insect Control shall have power and authority to use such means, methods, materials, liquids, or poisons, as shall be determined necessary to carry out the eradication of the said nuisances, or to use any other scientific means of eradication or control of such nuisances." Other sections of the ordinance make it unlawful for any person to interfere with the insectarian or his assistants and provide penalties for violations of any provisions of the ordinance.

Demonstration of autogiro in mosquito control.--A demonstration of the use of the autogiro in spraying oil on mosquito breeding places was recently given on Long Island by a commercial autogiro service company before entomologists and others interested in mosquito control, the witnesses including J. L. Webb, who represented this Bureau, and representatives from the States of New York and New Jersey and the New York City Department of Health. Admittedly, the development of the use of the autogiro for this purpose is still in the experimental stage. It was clearly shown, however, that there are distinct possibilities for the development of an efficient and rapid method of laying down an oil film on mosquito breeding places. Such a service would be especially desirable on undrained marsh areas immediately after heavy rains, when mosquitoes breed prolifically and present methods of oiling are time consuming. The consensus of opinion among those witnessing the demonstration was that the autogiro has certain advantages over the airplane for such service.

FOREIGN PARASITE INTRODUCTION

More pink bollworm parasites from Egypt.--The third and final shipment of Microbracon kirkpatricki Wilk. was received from H. L. Parker early in November. This comprised approximately 1,500 individuals in the immature stages. The material was in perfect condition and extensive emergence was taking place at the time of arrival. Several thousand adults have emerged from these three shipments at the pink bollworm laboratory at Presidio, Tex., and are being used as a rearing stock for large-scale production and liberation next season.

Japanese beetle parasites from Japan.--L. B. Parker and M. H. Brunson, Moorestown, N. J., report that on October 19 a consignment of 944 field-collected females of Tiphia popilliavora Roh. was received from Yokohama, Japan. These wasps were all collected at Yokohama, where previously the species had been practically unknown. In one locality, a small, filled-in area along the water front, only the Asiatic beetle (Anomala orientalis Waterh.) was being attacked, whereas only 2 or 3 miles away in another collecting area the attack was very largely restricted to the Japanese beetle. The consignment was packed in the usual type of cans used for shipment of adults and arrived in excellent condition, 86.3 percent of the females being alive and vigorous.

FOREIGN PLANT QUARANTINES

Recent entomological interceptions of interest.--Six living larvae of Ceratitis capitata Wied. were taken last July at Boston in three apricots in stores from Spain. This is the first record in our files of this fruit fly being intercepted in apricots. The Mediterranean fruit fly was also found at San Pedro, Calif., in star-apples (Chrysophyllum cainito) in ship's quarters from Hawaii. An adult of Platypus dimidiatus Chapu. was intercepted last August at New York in balsa (Ochroma lagopus) in cargo from Ecuador. Living specimens of Mertila malayensis Dist. were found last July at Honolulu, T. H., on orchids (Aerides lawrenceae and Trichoglottis brachiata) in baggage from Manila, P. I. A living specimen of Myrmecophila quadrispina Perkins was taken at Seattle, Wash., in soil around plants in baggage from China. A living adult of Aeolus facetus Cand. was intercepted at Mobile, Ala., with banana debris in cargo from Honduras. Living adults of Ernoporides jalappae Letz. were taken at New Orleans in four-o'clock (Mirabilis jalapa) roots in cargo from Mexico. The West Indian sweetpotato weevil (Euscepes batatae Waterh.) arrived last August at Washington, D. C., in a sweetpotato in the mail from British Guiana. A living specimen of Scolopostethus decoratus Hahn was found at Baltimore on dried heather in the mail from Scotland. A specimen of the European corn borer (Pyrausta nubilalis Hbn.) was intercepted at Philadelphia in broomcorn in the mail from Hungary. Kolla fasciata (Walk.) arrived at San Francisco with banana debris in cargo from Panama. Living larvae of Corymbites cinctus Payk., Dinoderus minutus Fab., and Nicobium castaneum Oliv. were intercepted last July at New York in the bark of pear-tree logs in cargo from France. Living adults of Arthrocorynus dotatus Champ. were found last July at New Orleans in hardwood logs in cargo from Mexico. A living adult of Pityogenes chalcographus L. was taken at Baltimore in the bark of fir boards used as dunnage in the hold of a ship from Sweden. A small amount of bark was adhering to the boards.

Recent pathological interceptions of interest.--Phoenicostroma chamaedoreae Syd. was intercepted at El Paso on August 24, the host being palm leaves from Mexico. This fungus was not represented in the Bureau of Plant Industry herbarium, but the intercepted material fits the description and illustration published by Sydow. Hendersonia n. sp. was collected on a cactus (Opuntia? sp.) from Mexico at the Washington inspection house on September 7. Phymatotrichum sp. was intercepted at Philadelphia on September 19 in cabbage leaves from Spain. Apparently no species of this fungus has been reported as attacking Brassica. Diseased taro roots from China were intercepted at New York on September 5 and were found to be infected with a phycomycete, possibly Phytophthora colocasiae Rac. Puccinia urbaniana P. Henn. was intercepted on September 18 at New York on Valerianodes sp. from Puerto Rico. The only previous interception was made on a different host in Puerto Rico when the material was offered for inspection for export. A lemon cutting from Italy intercepted at New York on August 22 was found to be infected with Phoma sp. The spores of the fungus were very minute, only doubtful species described for this genus having such spores. Our first interception of Septoria nigerrima Fckl. was made at New York on August 2 on pear leaves in baggage from Italy. According to Stevenson's manual this disease has been found in New York.

Baseballs found to have cotton cores.--Three shipments of baseballs made in Japan and designed to be sold here at a low price largely for the sandlot type of our national sport, were held up by the plant quarantine inspector in New York in October because their cores, or bodies, consisted of tightly compressed cottonseed hulls, which are forbidden entry to this country on account of the danger of such material carrying the well-known pink bollworm.

Cotton samples pose as packing.--Recently the appraiser at Galveston, Tex., reported a trunk and a box from Germany listed as personal effects. Packed between the articles were sizable rolls of raw cotton. The box contained mostly photographic supplies, and rolls of cotton were packed between the various articles, giving the impression that cotton was the cheapest and most readily available packing material found in Germany. This impression would probably have registered, had not the address of the owner been Cotton Exchange Building, Houston, Tex. From this baggage approximately 5 pounds of cotton samples of a good grade were collected and destroyed.

Bureau hopes to save rare orchids.--A shipment of some 25 orchids from Borneo, representing a rediscovery of a rare variety long believed lost to science, was found on inspection to be infested with 14 different types of pests, among which was an unknown weevil of apparently quite destructive character. Because of the rare nature of the collection every effort is now being made to free the shipment from this parasite without destroying the plants. Salvage treatment in this case is made difficult because an entirely new insect of unknown life habits is involved, as well as by the fact that the weevil is of the stem-boring type, hard to reach by ordinary treatment. It now appears from observation of these plants in quarantine quarters that at least a part of the shipment can be saved and turned over to the importer, freed from the parasite. It is quite within the realm of possibility that so destructive an insect might well have been the cause of an almost complete extermination of this orchid in its native haunts, thus accounting for its lengthy disappearance from botanical knowledge.

Stray leaves carry fungi.--In September a shipment of cycads arrived at the Washington inspection house from Australia. In the bushy crowns of these plants were wedged almost a peck of leaves of other plants, mostly eucalyptus, lodged there doubtless in the course of their fall from nearby trees. These stray passengers on examination showed two species of Phyllosticta, a species of Melasmia, and one of Sphaeropsis. In fact, this incidental debris carried more fungi, both in number and importance, than did the cycads themselves. This case presents an outstanding example of a channel of entry for pests which anyone unfamiliar with the inspection problem would be inclined to estimate as trivial; yet it is a channel for which the inspection staff must be constantly on the watch.

DOMESTIC PLANT QUARANTINES

Transit inspection.--During the fall shipping season for nursery stock, the checking of shipments at railway terminals has been increased through the assistance of inspectors on projects relating to the white pine blister rust and the European corn borer, and by State inspectors of Iowa, Illinois, Minnesota, New York, and Florida. Seasonal work closed at Kansas City on November 9 and at Omaha on November 15. It will be continued for a somewhat later period at Saint Paul, Detroit, Spokane, Portland, and Seattle. At the two latter points the shipping season normally continues well into December. Year-round inspection is carried on at Boston, New York, Philadelphia, Washington, Jacksonville, Fla., and Chicago. At Cleveland and Indianapolis arrangements are being made to resume the checking of shipments about November 20. A marked drop in violations of the white pine blister rust quarantine is noted, only one nurseryman having been reported thus far as failing to comply with requirements. A summary of the work of transit inspection at New York City during the fiscal year 1934, recently received from the inspector in charge, reports that 484 violations were found at that station, out of 158,133 shipments inspected. The violations were moving to 40 different States, the District of Columbia, and Canada. They related to the gypsy moth, the Japanese beetle, the satin moth, narcissus bulb pests, and white pine blister rust. General nursery stock made up the contents in about 40 percent of the violations, with rosebushes and miscellaneous cut flowers ranking next.

Citrus canker.--October inspections in three counties in Texas resulted in finding citrus canker infections of a very light and recurrent nature on one tree in Galveston County and one in Brazoria County. Sporadic infections had previously occurred on both premises. The infected tree in each instance was a Louisiana sweet round orange growing among satsumas. The trees were accordingly cut or trimmed and sprayed, and all defoliated leaves swept up and burned. Surrounding satsumas were also sprayed. The owners have agreed to allow destruction of the infected trees if infection is evident on the next inspection. The agent reports that while complete eradication of citrus canker from these two premises seems somewhat slow, he believes the continued efforts are showing good results in that the disease is being held very closely in check. The month's inspections covered 187,364 trees. In Louisiana inspections were made in 11 parishes but no citrus canker infections were found. The work covered 9,113 trees in groves and 18,000 in nurseries.

Phony peach disease.--Several commercial orchards in Spartanburg and Greenville Counties, S. C., were scouted in October at the request of State officials to determine whether the phony peach disease was increasing in that area. No infections were found, although infected trees had been noted in home orchards at Greer, in Greenville County, in the course of nursery inspection. In Georgia, commercial orchards were inspected in 16 counties. Certain varieties of peach were defoliated however and could not be inspected. Inspectors found it difficult in some counties to furnish service to everyone who requested it. There were 1,361,150 trees inspected, of which 14,343, or slightly more than 1 percent, were found to be infected, and these were destroyed. Nursery premises were inspected for the phony peach disease and peach root borer by State and Federal inspectors during the month around 6 nurseries in Arkansas, 24 in Tennessee, and 10 in Texas, and on 111 properties in Georgia. Owing to the strong demand for peach nursery stock, it appears that practically all salable peach stock grown in the Southern States this year may be dug and shipped during the fall.

Peach mosaic disease in Colorado.--The peach mosaic situation in western Colorado is covered in a recent report from the State Entomologist, in which he states that inspection has recently been made of all peach orchards, or approximately 350,000 trees, in the Palisade section of Mesa County, where some 6,500 infected trees were located. Of these, about 50 percent have been eradicated and it is expected that many others will be taken out. Two relief workers assisted a State inspector in the scouting and also assisted the growers in taking out the diseased trees. Inspection had not been made of some orchards in Mesa County and none in Delta County. Only one small nursery supplying annually a few hundred trees to local buyers is in the infected area. Budding wood, however, has been supplied by growers to nurserymen in the East and South, and the State Entomologist is now obtaining information as to points where such shipments have been made in recent years. The outbreak of peach mosaic in Colorado is recognized as a serious menace to the important peach-producing region along the Colorado River east of Grand Junction. It is known to occur only in Colorado and Texas.

CONTROL INVESTIGATIONS

Sterilization of Spanish grapes under way.--The first lot of Spanish grapes sterilized for the Mediterranean fruit fly was removed from storage on October 25. The grapes were placed on sale in Boston and sold at prices ranging from $2.70 to $7 per keg, each keg containing 46 pounds, the average price for the lot of 522 kegs being $4.85, or a little more than 10 cents per pound. From the results obtained in sterilizing the first lot, there is no question but that the treatment can be applied to Spanish grapes if the grapes are in good condition when placed in storage. The treatment requires that the grapes be cooled to a temperature of 30° to 31° F. at the center of the keg and held at that temperature for a period of 15 days. The first shipments of grapes amounted to 13,900 kegs and the second shipment was approximately 40,000 kegs. The third shipment, which is on its way from Spain, will also be approximately 40,000 kegs.

BEE CULTURE

American foulbrood recurs in treated combs after 5 years.--When combs infested with American foulbrood are disinfected with formaldehyde and returned to the bees, disease frequently recurs after brood reared in the combs has remained healthy for one or more seasons. It is commonly believed that there is little or no danger of recurrence beyond the second brood-rearing season. Jas. I. Hambleton reports that in 1929 at the Somerset, Md., laboratory, 9 colonies were placed on American foulbrood combs after the combs had been treated for different periods of time with formaldehyde gas. Disease developed in 3 of these colonies during the first season, in 1 the second season, in 1 the third season, in none the fourth season, and in 1 the fifth season. In cultural tests on the combs, slight growth after prolonged incubation was obtained from some of the combs in which disease developed during the first season, but no growth was obtained in cultures from the other sets of combs. Other colonies in the apiary which did not have treated combs remained healthy and no source of infection other than the treated combs could be discovered. Consequently, there seems to be little doubt but that in each instance the development of American foulbrood in the gas-treated combs was a recurrence. These results emphasize the danger connected with the use of treated combs, as well as the necessity for continuing regular inspection for 5 years or longer, when treated combs are used. They also indicate that disease may occasionally recur in combs, even when no growth is obtained in cultural tests.

Relation of pollen reserve to spring population of colony.--C. L. Farrar, Laramie, Wyo., reports that commercial beekeepers have manifested keen interest in the results obtained during the past 2 years at Laramie, in a study of the close relationship between the spring populations of overwintered colonies and the amount of reserve pollen left with the colonies in the fall or given to them during the late winter months. It has been found that in rearing brood good colonies will utilize 300 square inches of pollen in less than 3 weeks. In 1932-33 some colonies consumed more than 600 square inches of pollen from 5 to 6 weeks before new pollen became available. In 1933-34 equivalent colonies provided with 600 square inches had consumed this entire quantity by the time new pollen became available; however, last season was about 5 weeks earlier than those of former years and 3 weeks earlier than normal. In a survey conducted the last of September, using 1,500 and 1,100 colonies, respectively, in apiaries of two large beekeepers in northern Colorado, where it might be expected that more than average pollen reserves would be found, an examination of 226 colonies in 6 widely scattered yards gave the following results: In 3 yards at Greeley and vicinity, the pollen reserves per colony averaged 89, 118, and 171 square inches, respectively, whereas in 3 yards at Brush and vicinity, the average was 168, 240, and 334 square inches, respectively. Even though these localities have pollen available several weeks earlier in the spring than is the case at Laramie, these reserves are probably too low for maximum development of the colonies in late winter and spring. Furthermore, the variation in reserves between colonies in each yard was very great. The condition of these colonies will be checked next spring. During the dandelion flow at Laramie, Wyo., last spring, the experimental colonies having maximum reserves of pollen practically replaced the honey stores consumed in the winter period, whereas those wintered without pollen consumed over 50 pounds of honey and only maintained their weight during this flow.

Nectar surplus from goldenrod in Louisiana.--For the past 6 years goldenroad (Solidago altissima) has yielded a surplus of nectar in October at Baton Rouge, reports E. Oertel, of that laboratory. This surplus will be of considerable value to beekeepers, as it will aid in supplying additional honey for winter and early spring. In previous years the honey flow from goldenrod was apparently brought to a close by rainfall and a sudden drop in temperature, but in 1934 the flow ceased rather suddenly without any noticeable change in the weather. Although the maximum number of plants had stopped blossoming, apparently a large number of goldenrod blossoms were still available to the bees. Similar conditions existed at Donaldsonville, about 45 miles from Baton Rouge, where a scale colony also ceased to gain in weight at about the same time as did those at Baton Rouge. The abrupt cessation of the honey flow was marked by the attempt of some colonies of bees to rob other colonies.

Nevada honey producers use U. S. grades.--On a recent trip to Nevada, G. H. Vansell, of the Pacific Coast Bee Culture Field Laboratory, Davis, Calif. found that the Nevada Honey Producers' Association is still selling comb honey under the U. S. grading rules, although they have encountered difficulty with the Pacific coast dealers, who usually set up their own specifications for marketing. The association, with headquarters at Yerington, is managed under both State and Federal direction through the office of the Farm Adviser. Mr. Vansell also found a decided tendency on the part of the producers to switch from comb to extracted honey. Production and marketing problems are reported to be less difficult with extracted honey.

IDENTIFICATION AND CLASSIFICATION OF INSECTS

Relative of pink bollworm intercepted.--Specimens of lepidopterous larvae associated with seeds and pods of Althaea nudiflora sent from Alma-ata, U. S. S. R., and collected at the plant quarantine inspection house at Washington, D. C., have been identified by Carl Heinrich as Platyedra vilella Zell. The species is related to the notorious pink bollworm.

Apelma brevis Johannsen from Cuba.--Larvae of this small midge (Ceratopogonidae) intercepted at Philadelphia and Boston in August, associated with pineapples in ship's stores from Cuba, have recently been identified by Alan Stone. This species was originally described from Hawaii in 1927 and reported as a troublesome pest, since the larvae living in the water at the base of the leaves broke the leaf tissue and allowed injurious bacteria to enter. This is the first record, so far as can be discovered, of the occurrence of this species in the New World, although it probably originated there. All Apelma species of which the habits are known breed in water held by leaves.

First report of Orgilus in Hawaii.--Specimens of parasitic Hymenoptera sent in for identification by O. H. Swezey, Honolulu, T. H., have been placed by C. F. W. Muesebeck as apparently representing two species belonging to the braconid genus Orgilus. Apparently no species of this genus has ever been reported from the Hawaiian Islands.

A grass bug at Arlington Farm, Va.--F. W. Poos, Arlington Experiment Farm, recently reported that last summer chinch bugs had been doing considerable damage at the farm on a creeping bentgrass that was being experimented with for golf greens. A number of specimens collected in September by F. F. Dicke, were submitted to H. G. Barber for determination and were identified by him as Blissus hirtus Montandon, a grass-feeding species in the Northern States and Canada. So far as known, this species does not occur on any of the grains and has not hitherto been reported as occurring south of Pennsylvania. It seems very probable that the species has been transported, either in the egg or nymphal stage, concealed in the soil about roots of grasses received for experimental purposes from various northern points, such as Pennsylvania and Canada.

INSECTICIDE INVESTIGATIONS

Apple-washing experiments well along.--C. M. Smith reports that the Division's investigators at Wenatchee, Wash., are making rapid progress in their examination of apples washed by various processes in cooperation with the Bureau of Plant Industry. Attention has been devoted to lead and fluorine residues, and the results to date show satisfactory removal of the lead by most of the procedures, but rather unsatisfactory removal of fluorine. The analyses for lead of eastern apples washed by the Bureau of Plant Industry at College Park, Md., are also nearing completion. At both locations the electrolytic method for determining lead has proved to be very convenient and highly satisfactory.

Chemical evaluation of rotenone-bearing plants.--H. A. Jones has recently completed the chemical phases of a study of the relationship between chemical composition and toxicity of a group of rotenone-bearing plants.

The entomological part of the work was done by F. L. Campbell and W. N. Sullivan, of the Division of Control Investigations. The former will present an account of the investigation before the Pittsburgh, Pa., meeting of the American Association of Economic Entomologists, to be held during the last week of December 1934. The best measure of toxicity proved to be a value for rotenone-like materials, exclusive of toxicarol, but no definite recommendation for the adoption of any particular criterion is being made.

Devil's-shoestring promising as insecticide source.--Examination of more than 300 samples of plants of the species Cracca virginiana, a common weed known as devil's-shoestring, has shown two samples to contain nearly 2 percent rotenone and given indications that several others will exceed this figure appreciably. These plants compare favorably with some samples of derris, and serve to renew the hope that this domestic species may become an agricultural crop and furnish cheaper insecticides to the consumer.

The insecticide anabasine found in native plant.--It has been found very recently that the roots of a plant from New Mexico, believed to be Nicotiana glauca, contain anabasine, an alkaloid similar to nicotine in chemical nature and insecticidal effect. This valuable insecticide has heretofore been found only in a Russian plant, and the finding of it in a native species may possibly lead to a larger and cheaper supply of insecticides.

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